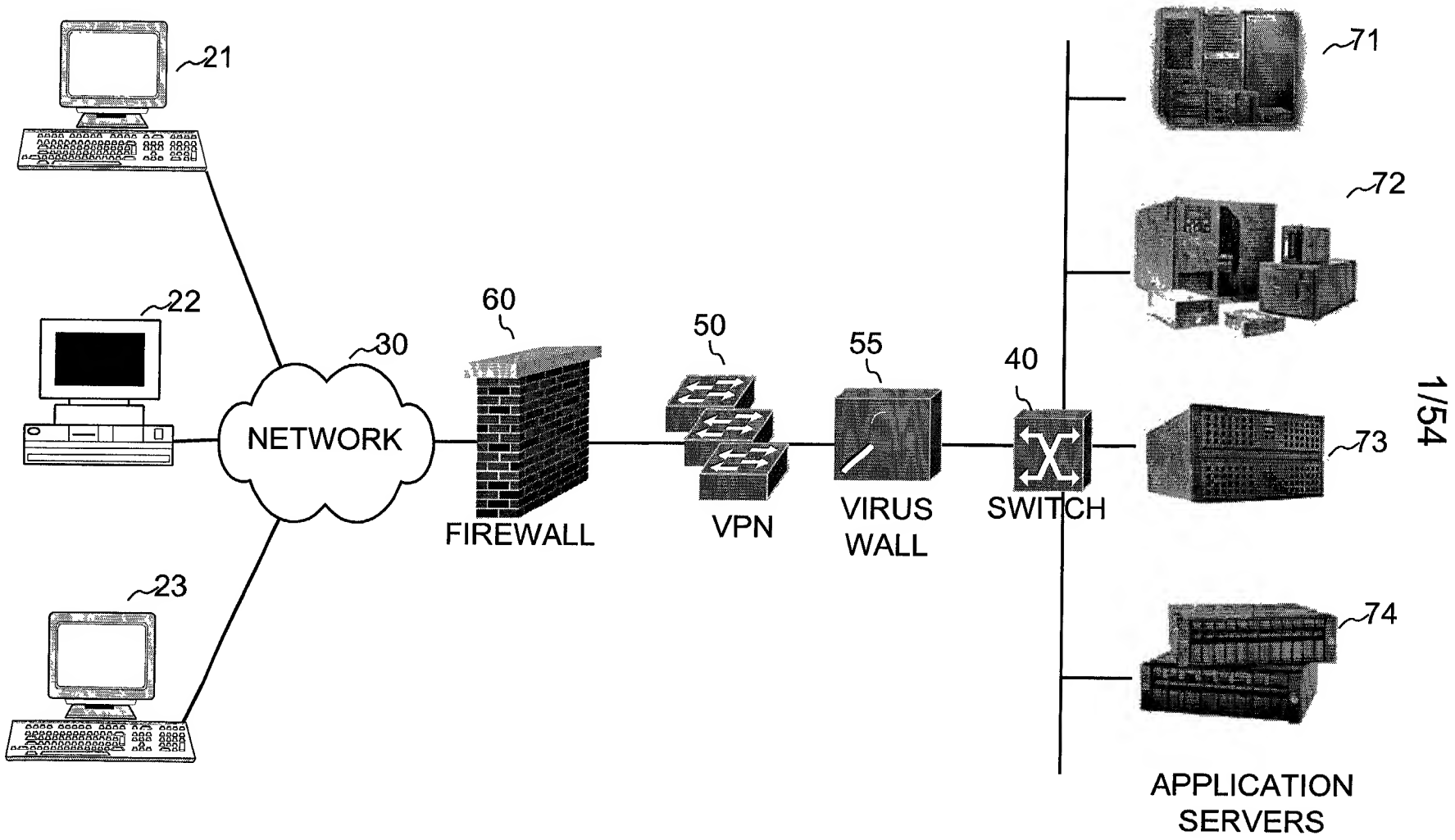

21
22
23
30
NETWORK
60
FIREWALL
50
VPN
55
VIRUS
WALL
40
SWITCH
71
72
73
74
APPLICATION
SERVERS

FIG. 1

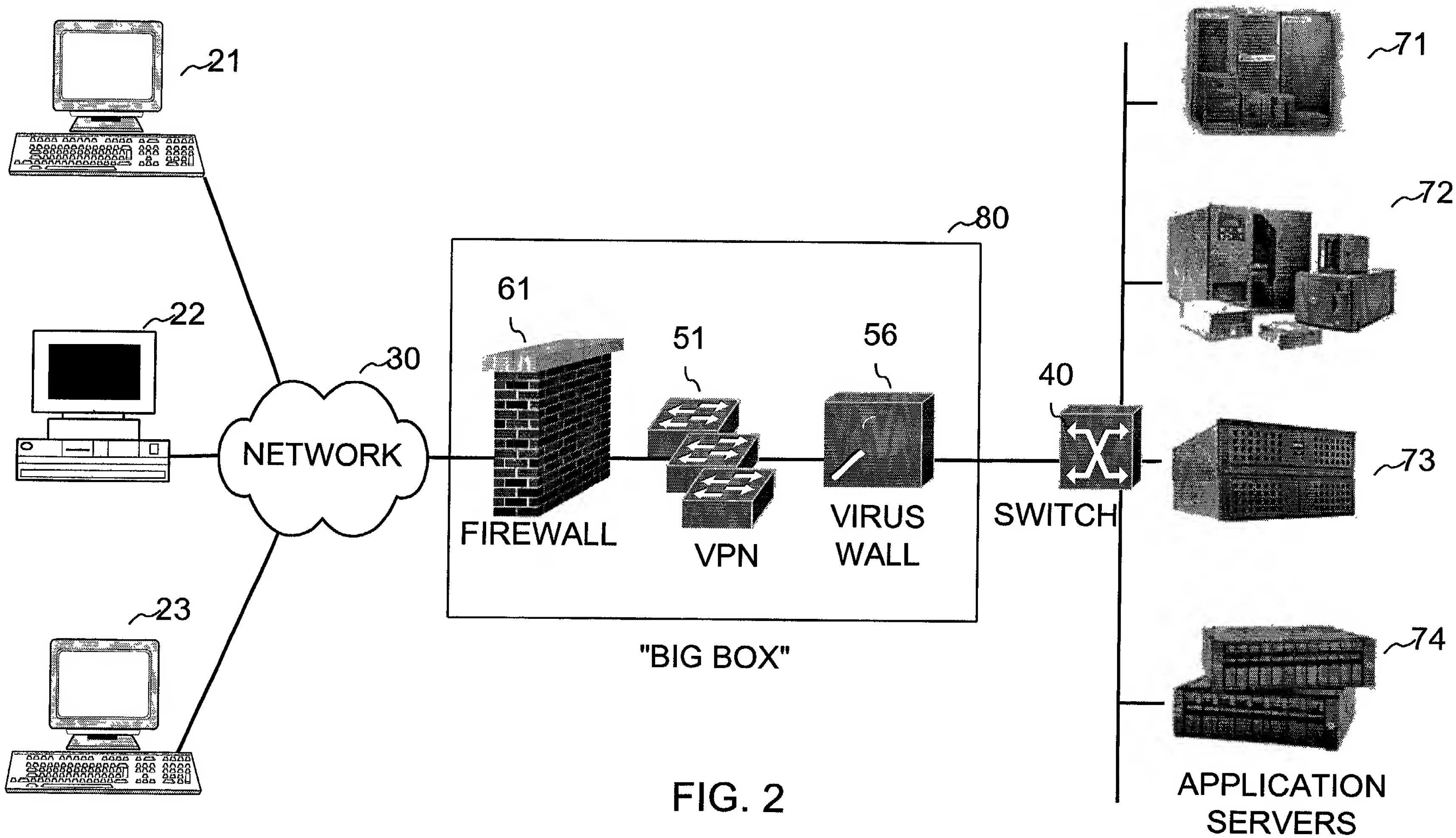

21
22
23
NETWORK
30
61
FIREWALL
51
VPN
56
VIRUS
WALL
80
"BIG BOX"
40
SWITCH
71
72
73
74
APPLICATION
SERVERS

FIG. 2

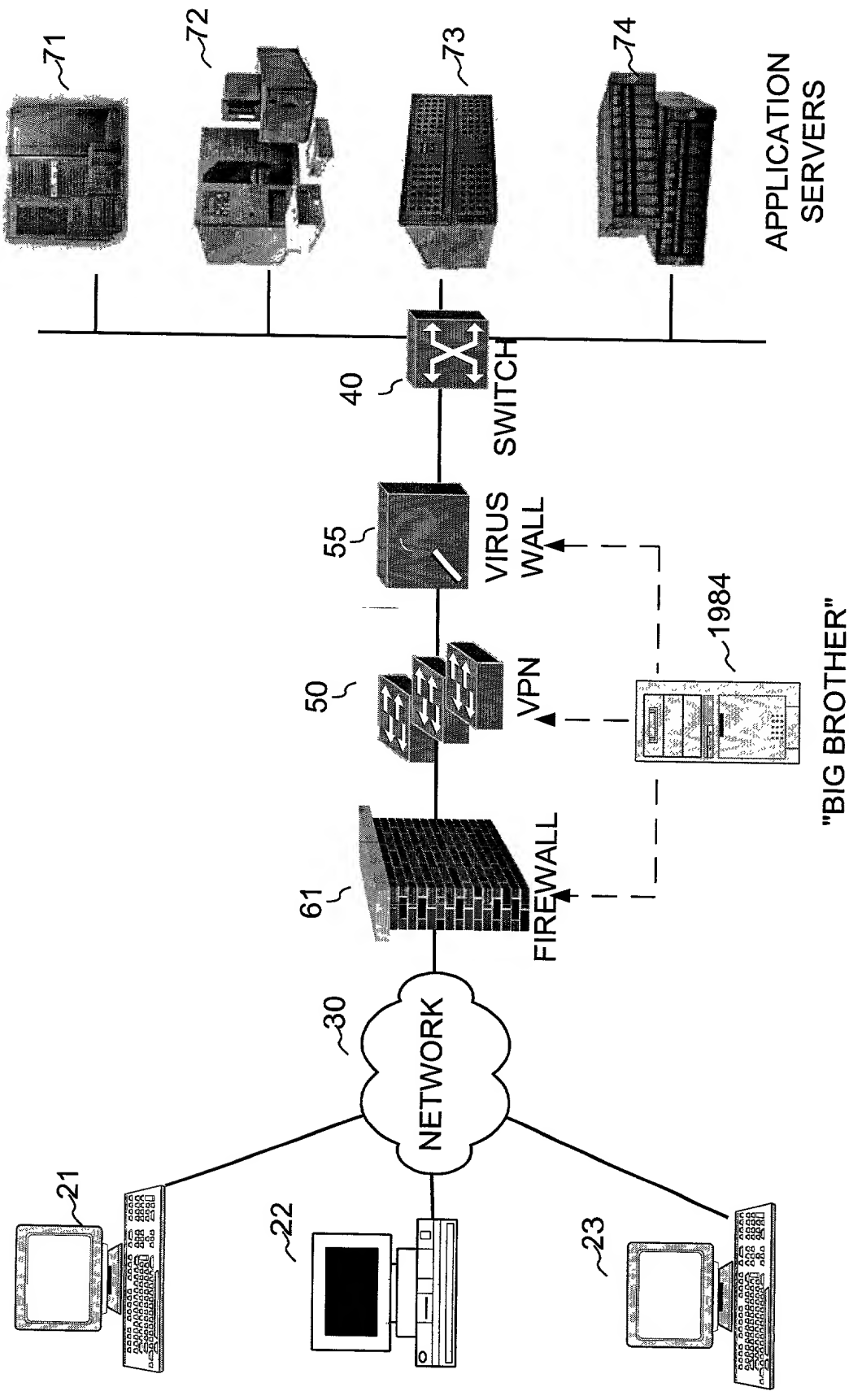

71
72
73
74
APPLICATION SERVERS
40
SWITCH
55
VIRUS WALL
50
VPN
1984
"BIG BROTHER"
61
FIREWALL
30
NETWORK
21
22
23

FIG. 3

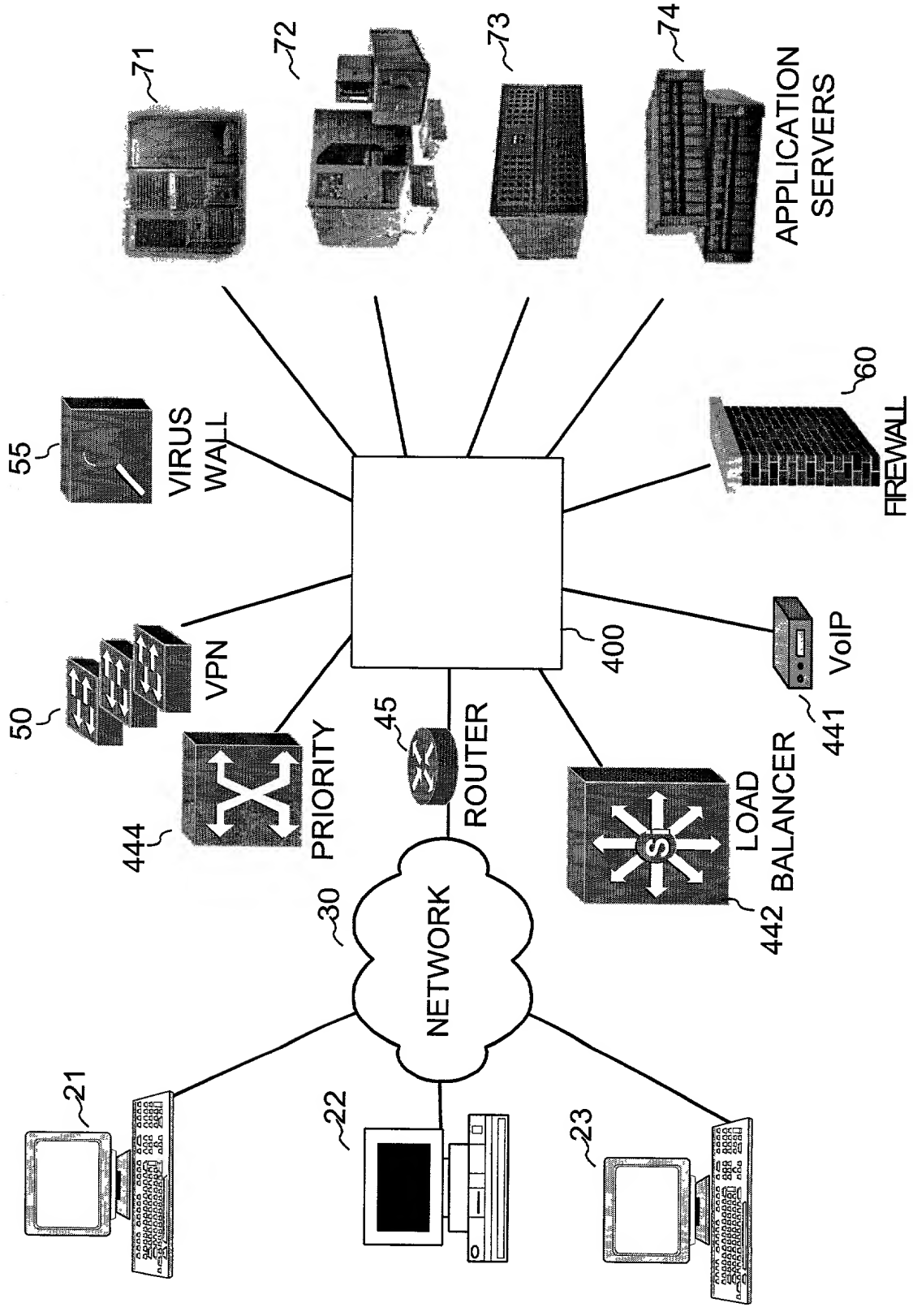

71
72
73
74
APPLICATION SERVERS
55
VIRUS WALL
60
FIREWALL
50
VPN
400
444
PRIORITY
45
ROUTER
441
VoIP
LOAD BALANCER
442
30
NETWORK
21
22
23

FIG. 4

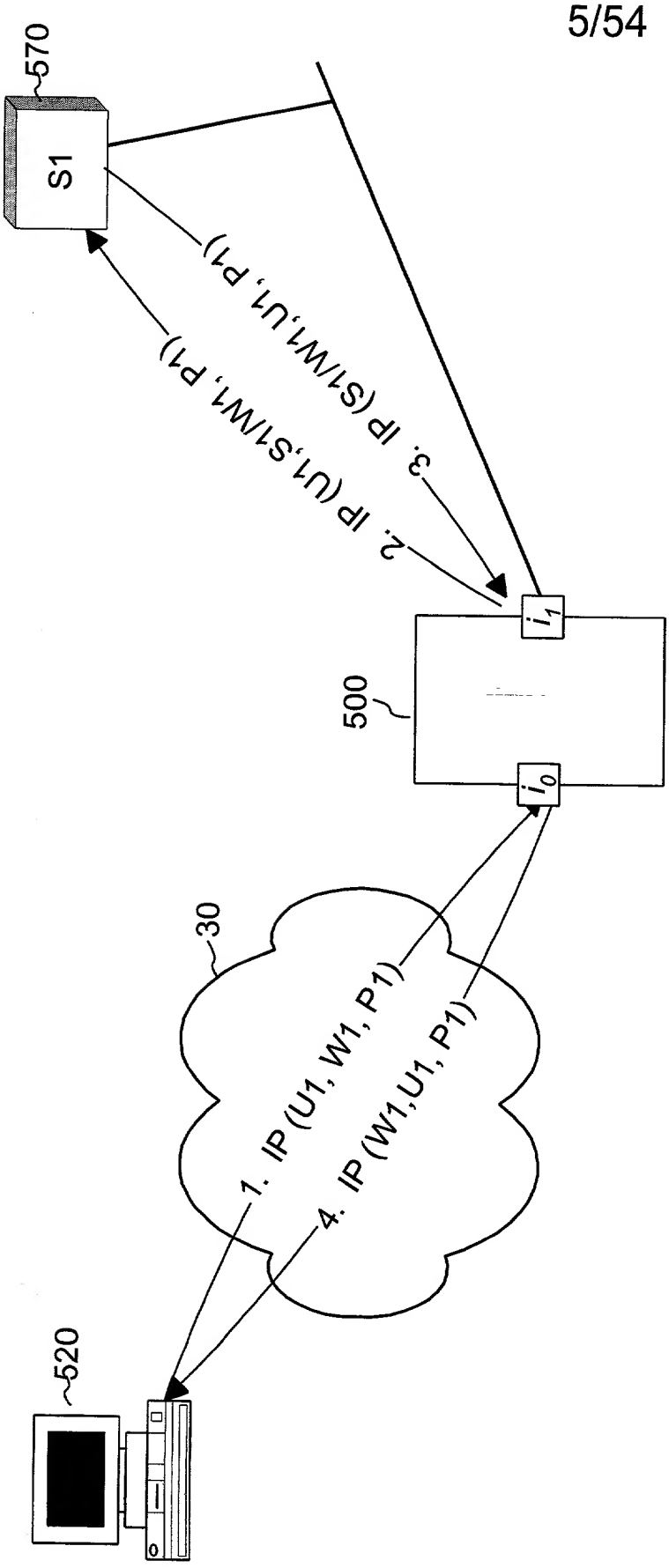

570
S1
3. IP (S1/W1,U1, P1)
2. IP (U1,S1/W1, P1)
500
i_1
i_0
30
1. IP (U1, W1, P1)
4. IP (W1,U1, P1)
520

FIG. 5

STEP	FROM	TO	SOURCE IP	DESTINATION IP	SERVICE PORT
1	U1 (CLIENT)	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	S1 (SERVER)	U1	S1 (IF NAT IS REQUIRED); W1 (IF S1 SUPPORTS LOOPBACK OR ALIAS)	P1
3	S1	PACKETING ENGINE	S1 (IF NAT IS REQUIRED); W1 (IF S1 SUPPORTS LOOPBACK OR ALIAS)	U1	P1
4	PACKETING ENGINE	U1	W1	U1	P1

531

FIG. 5A

STEP	FROM	TO	SOURCE IP	DESTINATION IP	SERVICE PORT
1	U1	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	S1	U1	W1	P1
3	S1	PACKETING ENGINE	W1	U1	P1
4	PACKETING ENGINE	U1	W1	U1	P1

533

FIG. 5C

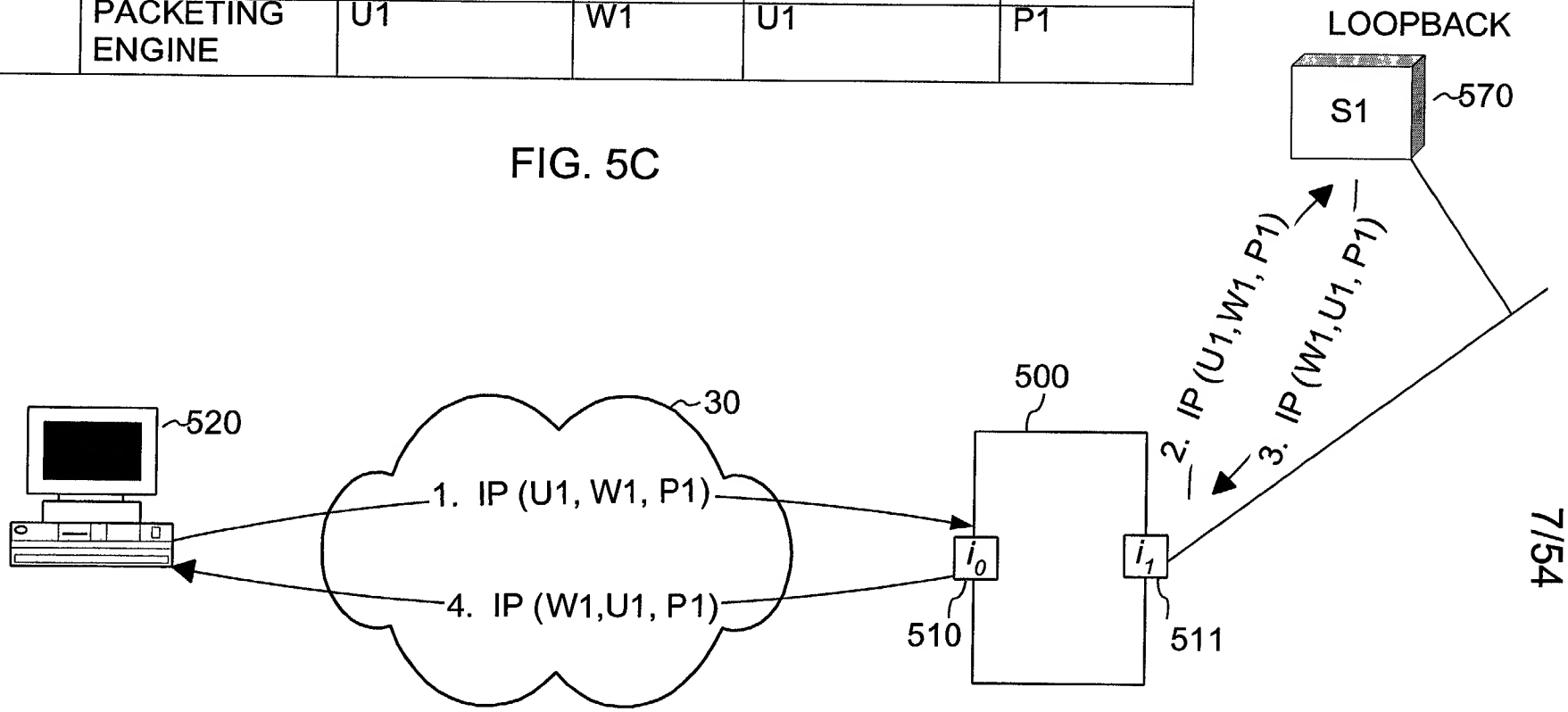


FIG. 5B

TABLE MAINTAINED BY PACKETING ENGINE							
RECEIVE PACKET INBOUND TO PACKETING ENGINE				SEND IT OUTBOUND FROM PACKETING ENGINE			
RECEIVED ON INTERFACE	SOURCE ADDRESS		DEST. IP ADDRESS	SERVICE PORT	SEND FROM INTERFACE	DEST. SYSTEM TYPE	SEND PACKET TO
	MAC	IP					MAC / IP
I_0			W1	P1	I_1	LOOPBACK	$S1_M$ / W1
I_1	$S1_M$	W1		P1	I_0	ROUTER	DEFAULT ROUTE

534

FIG. 5D

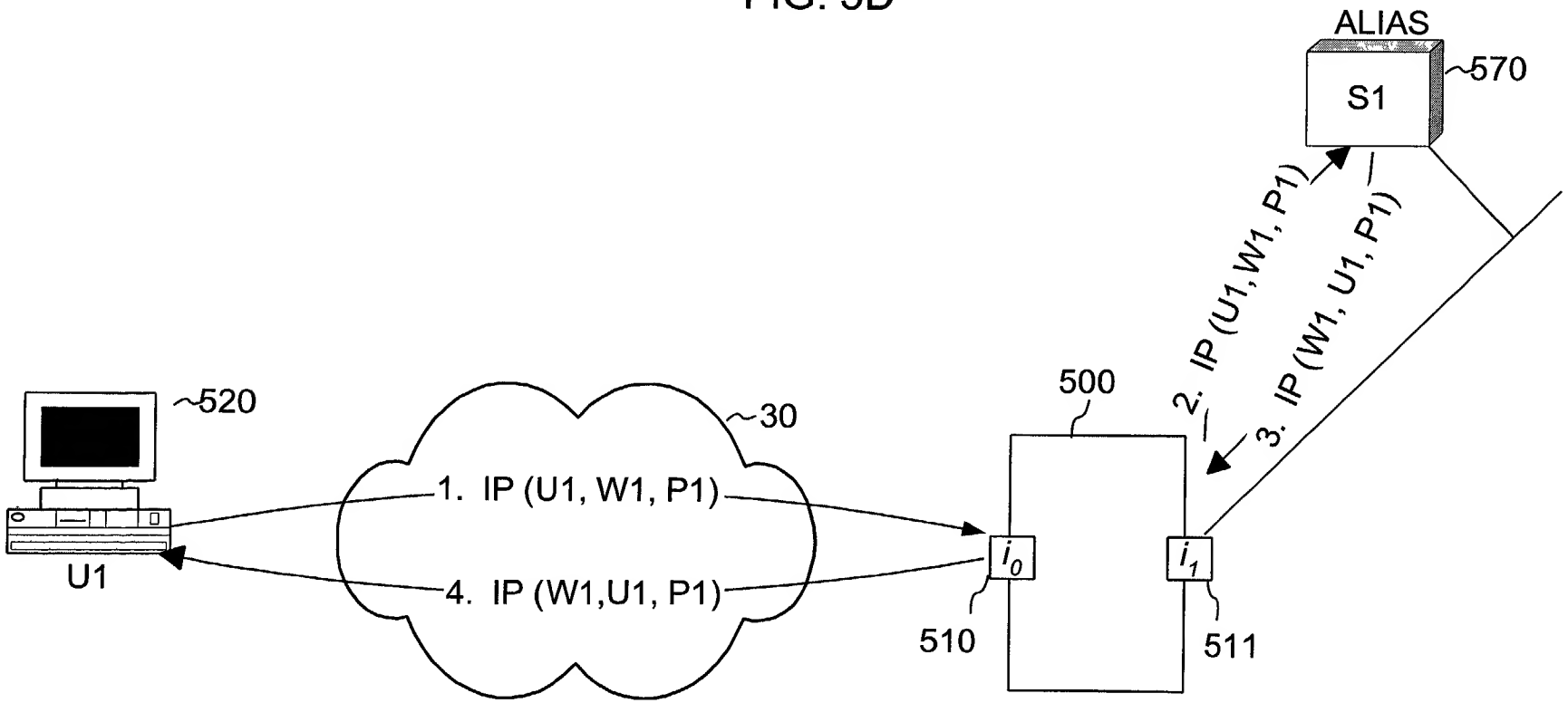


FIG. 5E

STEP	FROM	TO	SOURCE IP	DESTINATION IP	SERVICE PORT
1	U1	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	S1	U1	W1	P1
3	S1	PACKETING ENGINE	W1	U1	P1
4	PACKETING ENGINE	U1	W1	U1	P1

536

FIG. 5F

TABLE MAINTAINED BY PACKETING ENGINE								
RECEIVE PACKET INBOUND TO PACKETING ENGINE					SEND IT OUTBOUND FROM PACKETING ENGINE			
RCX ON INT.	SOURCE ADDRESS		DESTINATION IP ADDRESS	SERVICE PORT	SEND VIA INT.	DEST. SYSTEM TYPE	SEND PACKET TO	
	MAC	IP					MAC	IP
I_0			W1	P1	I_1	ALIAS	$S1_M$	W1
I_1	$S1_M$	W1		P1	I_0	ROUTER		DEFAULT ROUTE

537

538

FIG. 5G

STEP	FROM	TO	SOURCE IP	DESTINATION IP	SERVICE PORT
1	U1	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	S1	U1	S1	P1
3	S1	PACKETING ENGINE	S1	U1	P1
4	PACKETING ENGINE	U1	W1	U1	P1

539

FIG. 5I

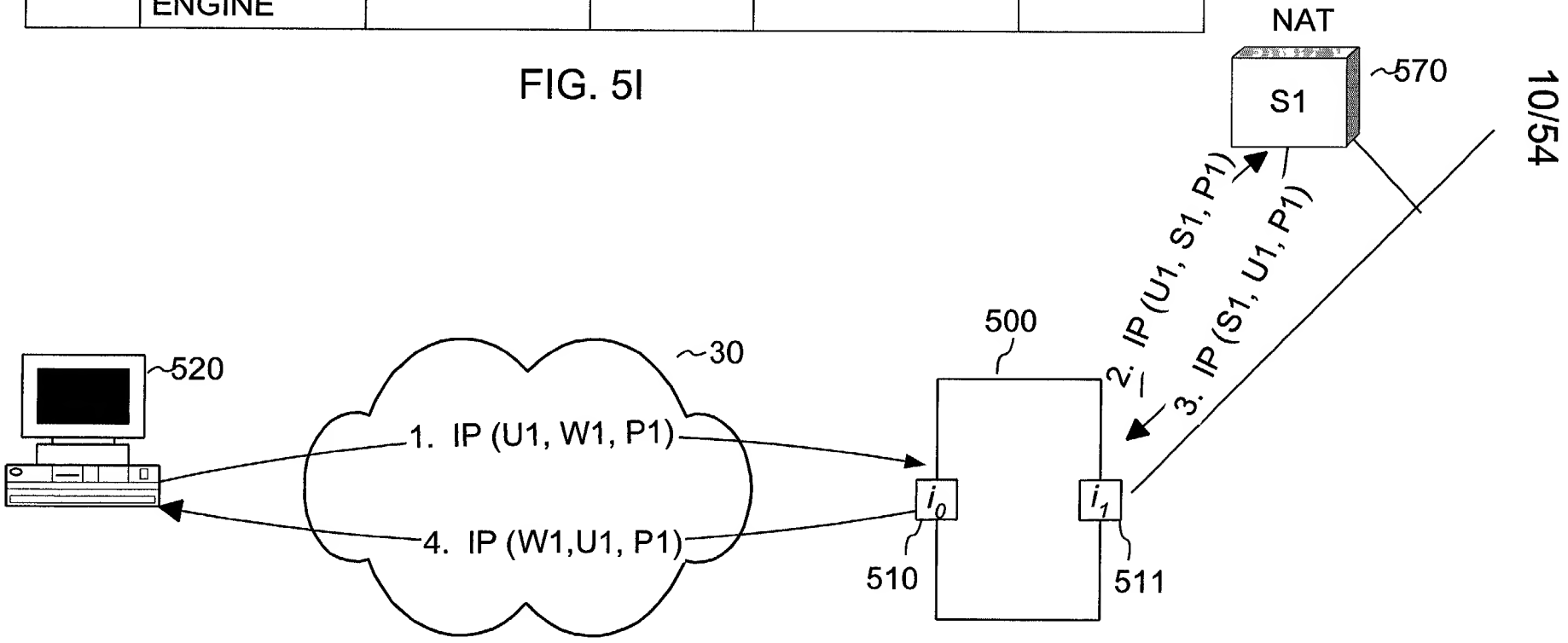


FIG. 5H

TABLE MAINTAINED BY PACKETING ENGINE							
RECEIVE PACKET INBOUND TO PACKETING ENGINE				SEND IT OUTBOUND FROM PACKETING ENGINE			
RCX ON INT.	SOURCE IP ADDRESS	DESTINATION IP ADDRESS	SERVICE PORT	SEND VIA INT.	DEST. SYSTEM TYPE	SEND PACKET TO IP ADDRESS	540
I_0		W1	P1	I_1	NAT REQUIRED	S1	
I_1	S1		P1	I_0 (AFTER REVERSE NAT SOURCE IP TO W1)	ROUTER	DEFAULT ROUTE	

FIG. 5J

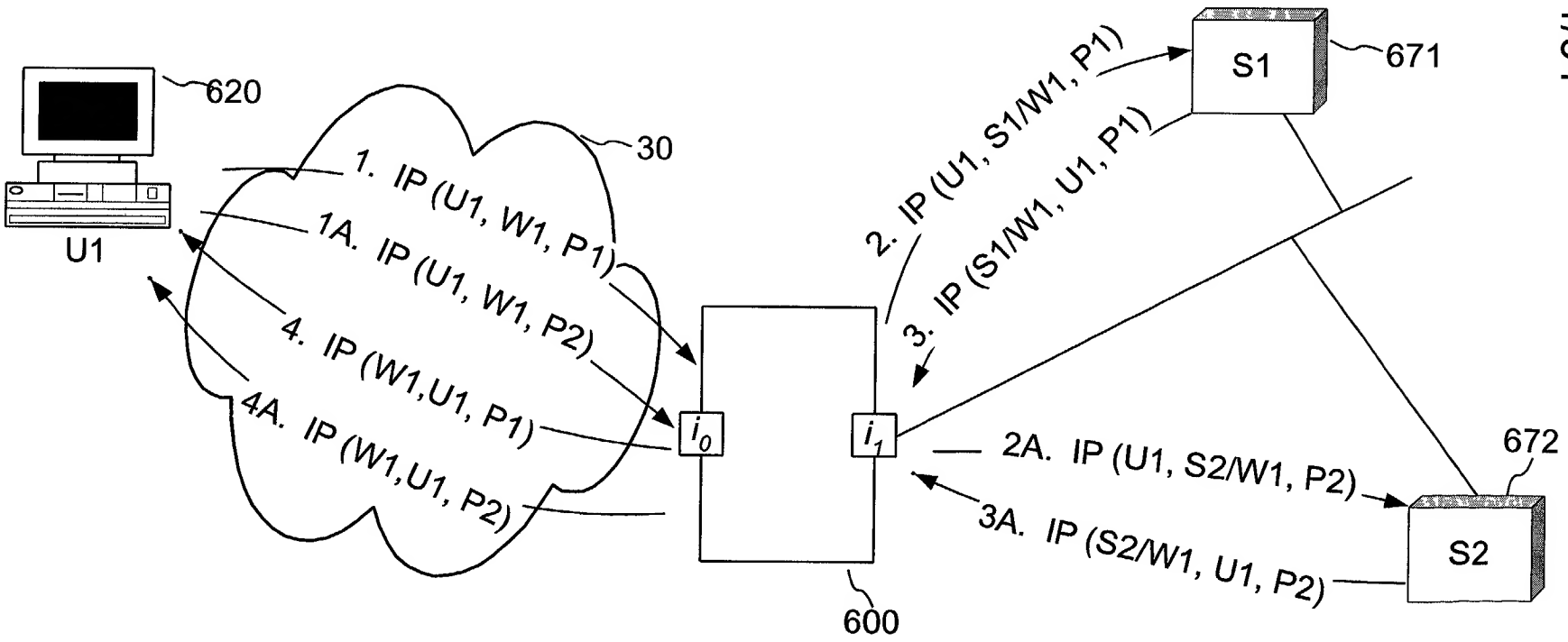


FIG. 6

STEP	FROM	TO	SOURCE IP	DESTINATION IP	PORT
PORT P1					
1	U1 (CLIENT)	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	S1 (SERVER)	U1	S1 (IF NAT IS REQUIRED); W1 (IF S1 SUPPORTS LOOPBACK OR ALIAS)	P1
3	S1	PACKETING ENGINE	S1 (IF NAT IS REQUIRED); W1 (IF S1 SUPPORTS LOOPBACK OR ALIAS)	U1	P1
4	PACKETING ENGINE	U1	W1	U1	P1
PORT P2					
1A	U1 (CLIENT)	PACKETING ENGINE	U1	W1	P2
2A	PACKETING ENGINE	S2 (SERVER)	U1	S2 (IF NAT IS REQUIRED); W1 (IF S2 SUPPORTS LOOPBACK OR ALIAS)	P2
3A	S1	PACKETING ENGINE	S2 (IF NAT IS REQUIRED); W1 (IF S1 SUPPORTS LOOPBACK OR ALIAS)	U1	P2
4A	PACKETING ENGINE	U1	W1	U1	P2

631

FIG. 6A

TABLE MAINTAINED BY PACKETING ENGINE								
RECEIVE PACKET INBOUND TO PACKETING ENGINE					SEND IT OUTBOUND FROM PACKETING ENGINE			
RCX ON INT.	SOURCE IP ADDRESS		DEST. IP ADDRESS	SERVICE PORT	SEND VIA INT.	DEST. SYSTEM TYPE	SEND PACKET TO	
	MAC	IP					MAC	IP
I_0			W1	P1	I_1	LOOPBACK	$S1_M$	W1
						ALIAS	$S1_M$	W1
						NAT		S1
I_1	$S1_M$	W1		P1	I_0	ROUTER		DEFAULT ROUTE
	$S1_M$	S1			I_0 (AFTER REVERSE NAT SOURCE IP TO W1)			
I_0			W1	P2	I_1	LOOPBACK	$S2_M$	W1
						ALIAS	$S2_M$	W1
						NAT		S2
I_1	$S2_M$	W1		P2	I_0	ROUTER		DEFAULT ROUTE
	$S2_M$	S2			I_0 (AFTER REVERSE NAT SOURCE IP TO W1)			

632

FIG. 6B

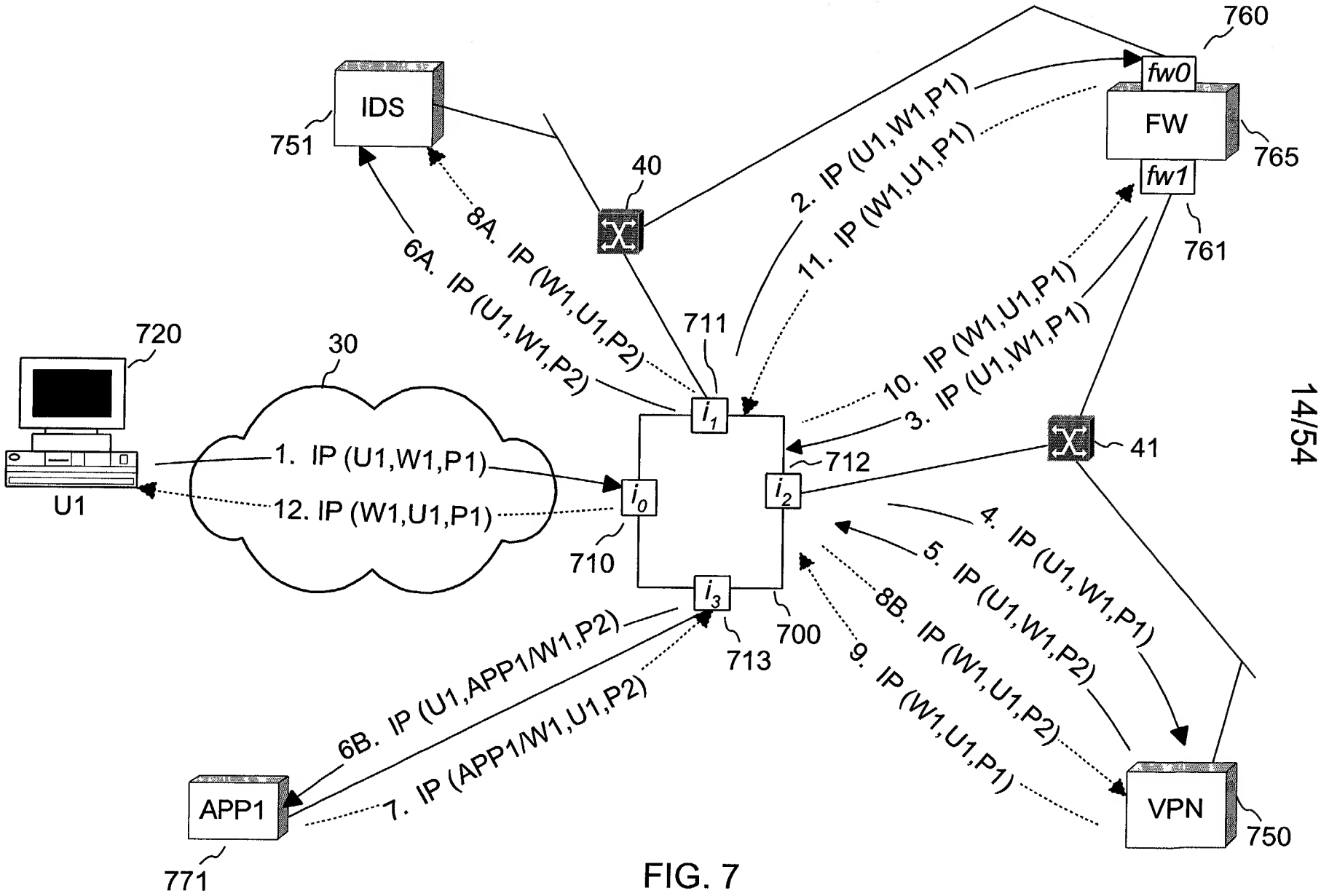

760
fw0
FW
fw1
765
761
IDS
751
40
2. IP (U1,W1,P1)
11. IP (W1,U1,P1)
8A. IP (W1,U1,P2)
6A. IP (U1,W1,P2)
711
720
30
10. IP (W1,U1,P1)
3. IP (U1,W1,P1)
41
712
1. IP (U1,W1,P1)
12. IP (W1,U1,P1)
U1
710
700
713
4. IP (U1,W1,P1)
5. IP (U1,W1,P2)
8B. IP (W1,U1,P2)
9. IP (W1,U1,P1)
6B. IP (U1,APP1/W1,P2)
7. IP (APP1/W1,U1,P2)
APP1
771
VPN
750

FIG. 7

STEP	FROM	TO	SOURCE IP	DESTINATION IP	PORT
1	U1 (CLIENT)	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	FW (INTERFACE FW0)	U1	W1	P1
3	FW (INTERFACE FW1)	PACKETING ENGINE	U1	W1	P1
4	PACKETING ENGINE	VPN	U1	W1	P1
5	VPN	PACKETING ENGINE	U1	W1	P2
6A	PACKETING ENGINE	IDS	U1	W1	P2
6B	PACKETING ENGINE	APP1	U1	APP1 (IF NAT REQUIRED); W1 (IF LOOPBACK OR ALIAS SUPPORTED BY APP1)	P2
7	APP1	PACKETING ENGINE	APP1 (IF NAT REQUIRED); W1 (IF LOOPBACK OR ALIAS SUPPORTED BY APP1)	U1	P2
8A	PACKETING ENGINE	IDS	W1	U1	P2
8B	PACKETING ENGINE	VPN	W1	U1	P2
9	VPN	PACKETING ENGINE	W1	U1	P1
10	PACKETING ENGINE	FW (INTERFACE FW1)	W1	U1	P1
11	FW (INTERFACE FW0)	PACKETING ENGINE	W1	U1	P1
12	PACKETING ENGINE	U1	W1	U1	P1

731

FIG. 7A

TABLE MAINTAINED BY PACKETING ENGINE								
RECEIVE PACKET INBOUND TO PACKETING ENGINE					SEND IT OUTBOUND FROM PACKETING ENGINE			
RCX ON INT.	SOURCE ADDRESS		DEST. IP ADDRESS	SERVICE PORT	SEND VIA IINT.	DEST. SYSTEM TYPE	SEND PACKET TO	
	MAC	IP					MAC	IP
I_0			W1	P1	I_1	TRANSPARENT	$FW0_M$	W1
I_2	$FW1_M$		W1	P1	I_2	TRANSPARENT	VPN_M	W1
I_2	VPN_M		W1	P2	I_1	TRANSPARENT	IDS_M	W1
					I_3	LOOPBACK	$APP1_M$	W1
						ALIAS	$APP1_M$	W1
						NAT		APP1
I_1	IDS_M			P2	I_3	LOOPBACK	$APP1_M$	W1
						ALIAS	$APP1_M$	W1
						NAT		APP1
I_3	$APP1_M$	APP1 OR W1		P2	I_1	TRANSPARENT	IDS_M	
					I_2	TRANSPARENT	VPN_M	
I_2	VPN_M	W1		P1	I_2	TRANSPARENT	$FW1_M$	
I_1	$FW0_M$	W1		P1	I_0	ROUTER		DEFAULT ROUTE

732

FIG. 7B

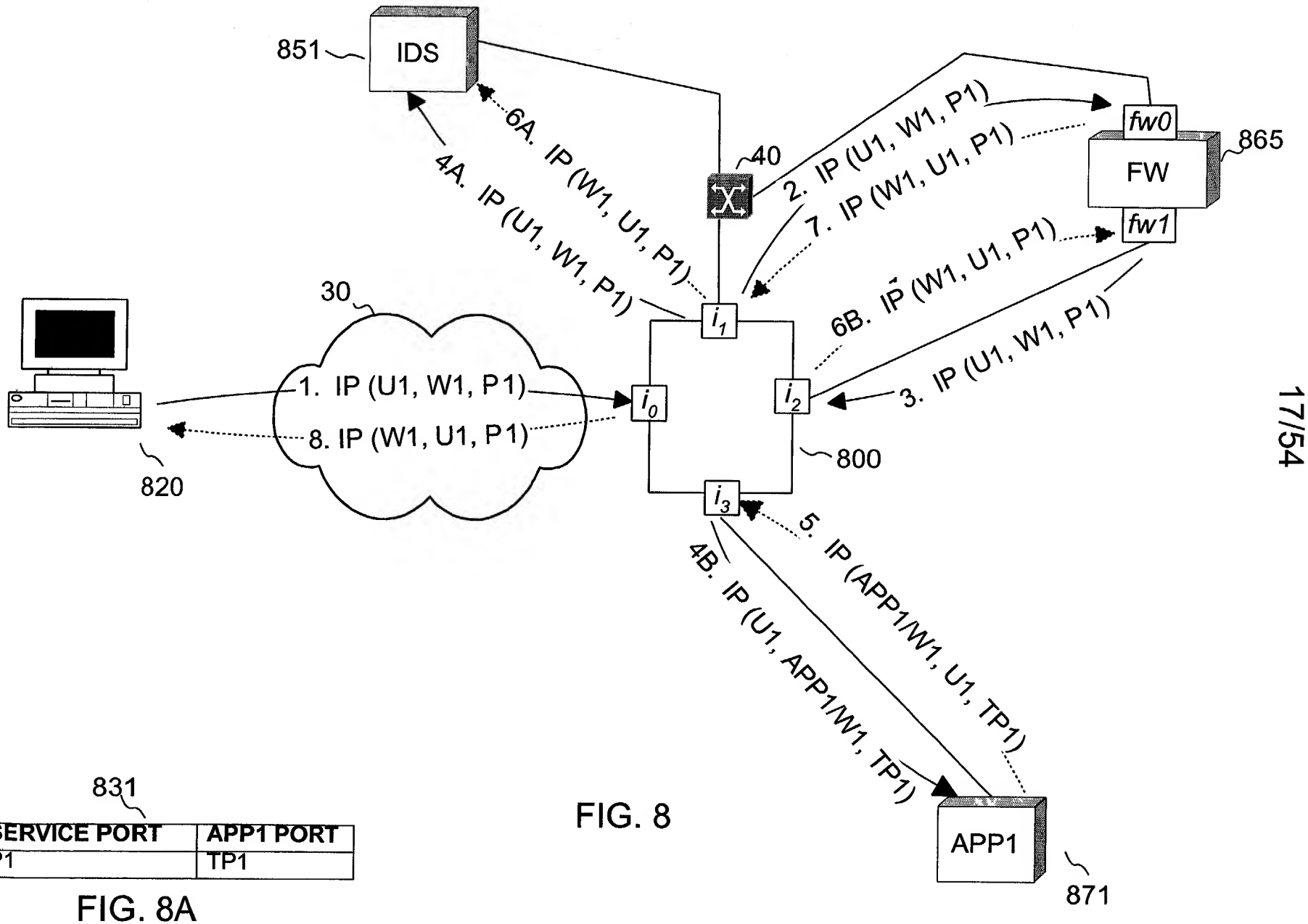


FIG. 8

831

SERVICE PORT	APP1 PORT
P1	TP1

FIG. 8A

STEP	FROM	TO	SOURCE IP	DESTINATION IP	SERVICE PORT
1	U1 (CLIENT)	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	FW (INTERFACE FW0)	U1	W1	P1
3	FW (INTERFACE FW1)	PACKETING ENGINE	U1	W1	P1
4A	PACKETING ENGINE	IDS	U1	W1	P1
4B	PACKETING ENGINE	APP1	U1	APP1 (IF NAT REQUIRED); W1 (IF LOOPBACK OR ALIAS SUPPORTED BY APP1)	TP1
5	APP1	PACKETING ENGINE	APP1 (IF NAT REQUIRED); W1 (IF LOOPBACK OR ALIAS SUPPORTED BY APP1)	U1	TP1
6A	PACKETING ENGINE	IDS	W1	U1	P1
6B	PACKETING ENGINE	FW (INTERFACE FW1)	W1	U1	P1
7	FW (INTERFACE FW0)	PACKETING ENGINE	W1	U1	P1
8	PACKETING ENGINE	U1	W1	U1	P1

832

FIG. 8B

TABLE MAINTAINED BY PACKETING ENGINE									
RECEIVE PACKET INBOUND TO PACKETING ENGINE					SEND IT OUTBOUND FROM PACKETING ENGINE				
RCX ON INT.	SOURCE ADDRESS		DEST. IP ADDRESS	SERVICE PORT	SEND VIA INT.	DEST. SYSTEM TYPE	SEND PACKET TO		PORT
	MAC	IP					MAC	IP	
I_0			W1	P1	I_1	TRANSPARENT	$FW0_M$	W1	P1
I_2	FW_M		W1	P1	I_1	TRANSPARENT	IDS_M	W1	P1
					I_3	LOOPBACK	$APP1_M$	W1	TP1
						ALIAS	$APP1_M$	W1	TP1
						NAT		APP1	TP1
I_1	IDS_M			P1	I_3	LOOPBACK	$APP1_M$	W1	TP1
						ALIAS	$APP1_M$	W1	TP1
						NAT		APP1	TP1
I_3	$APP1_M$	APP1 OR W1		TP1	I_1	TRANSPARENT	IDS_M		P1
					I_2	TRANSPARENT	$FW1_M$		P1
I_1	FW_M	W1		P1	I_0	ROUTER		DEFAULT ROUTE	P1

833

FIG. 8C

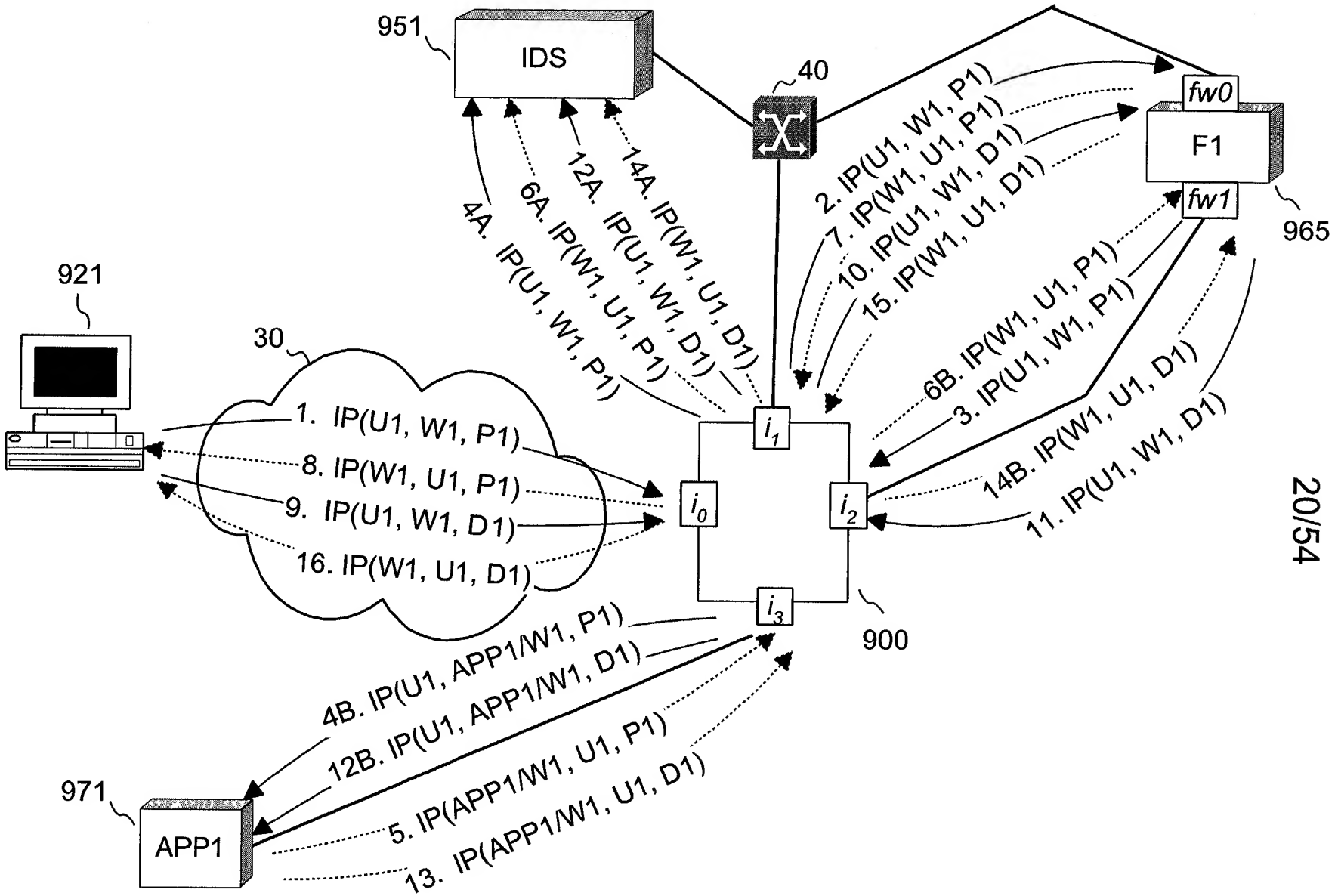

951
IDS
40
fw0
F1
fw1
965
921
30
1. IP(U1, W1, P1)
8. IP(W1, U1, P1)
9. IP(U1, W1, D1)
16. IP(W1, U1, D1)
4A. IP(U1, W1, P1)
6A. IP(W1, U1, P1)
12A. IP(U1, W1, D1)
14A. IP(W1, U1, D1)
2. IP(U1, W1, P1)
7. IP(W1, U1, P1)
10. IP(U1, W1, D1)
15. IP(W1, U1, D1)
6B. IP(W1, U1, P1)
3. IP(U1, W1, P1)
14B. IP(W1, U1, D1)
11. IP(U1, W1, D1)
i_0
i_1
i_2
i_3
900
4B. IP(U1, APP1/W1, P1)
12B. IP(U1, APP1/W1, D1)
5. IP(APP1/W1, U1, P1)
13. IP(APP1/W1, U1, D1)
971
APP1

FIG. 9

STEP	FROM	TO	SOURCE IP	DESTINATION IP	PORT
1	U1 (CLIENT)	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	FIREWALL F1 (INT. FW0)	U1	W1	P1
3	FIREWALL F1 (INT. FW1)	PACKETING ENGINE	U1	W1	P1
4A	PACKETING ENGINE	IDS	U1	W1	P1
4B	PACKETING ENGINE	APP1	U1	APP1 (IF NAT); W1 (IF LOOPBACK OR ALIAS)	P1
5	APP1	PACKETING ENGINE	APP1 (IF NAT); W1 (IF LOOPBACK OR ALIAS)	U1	P1
6A	PACKETING ENGINE	IDS	W1	U1	P1
6B	PACKETING ENGINE	FIREWALL F1 (INT. FW1)	W1	U1	P1
7	FIREWALL F1 (INT. FW0)	PACKETING ENGINE	W1	U1	P1
8	PACKETING ENGINE	U1	W1	U1	P1
9	U1 (CLIENT)	PACKETING ENGINE	U1	W1	D1
10	PACKETING ENGINE	FIREWALL F1 (INT. FW0)	U1	W1	D1
11	FIREWALL F1 (INT. FW1)	PACKETING ENGINE	U1	W1	D1
12A	PACKETING ENGINE	IDS	U1	W1	D1
12B	PACKETING ENGINE	APP1	U1	APP1 (IF NAT); W1 (IF LOOPBACK OR ALIAS)	D1
13	APP1	PACKETING ENGINE	APP1 (IF NAT); W1 (IF LOOPBACK OR ALIAS)	U1	D1
14A	PACKETING ENGINE	IDS	W1	U1	D1
14B	PACKETING ENGINE	FIREWALL F1 (INT. FW1)	W1	U1	D1
15	FIREWALL F1 (INT. FW0)	PACKETING ENGINE	W1	U1	D1
16	PACKETING ENGINE	U1	W1	U1	D1

931

FIG. 9A

TABLES MAINTAINED BY PACKETING ENGINE								
RECEIVE PACKET INBOUND TO PACKETING ENGINE					SEND IT OUTBOUND FROM PACKETING ENGINE			
RCX ON INT.	SOURCE ADDRESS		DEST. IP ADDRESS	SERVICE PORT	SEND VIA INT.	DEST. SYSTEM TYPE	SEND PACKET TO	
	MAC	IP					MAC	IP
I_0			W1	P1 OR PORT IN RANGE OF 1025→1125	I_1	TRANSPARENT	$FW0_M$	W1
I_2	$FW1_M$		W1	P1 OR PORT IN RANGE OF 1025→1125	I_1	TRANSPARENT	IDS_M	W1
					I_3	LOOPBACK	$APP1_M$	W1
						ALIAS	$APP1_M$	W1
						NAT		APP1
I_1	IDS_M			P1 OR PORT IN RANGE OF 1025→1125	I_3	LOOPBACK	APP1	W1
						ALIAS	$APP1_M$	W1
						NAT		APP1
I_3	$APP1_M$	APP1 OR W1		P1 OR PORT IN RANGE OF 1025→1125	I_1	TRANSPARENT	IDS_M	
					I_2	TRANSPARENT	$FW1_M$	
I_1	$FW2_M$	W1		P1 OR PORT IN RANGE OF 1025→1125	I_0	ROUTER		DEFAULT ROUTE

932

FIG. 9B

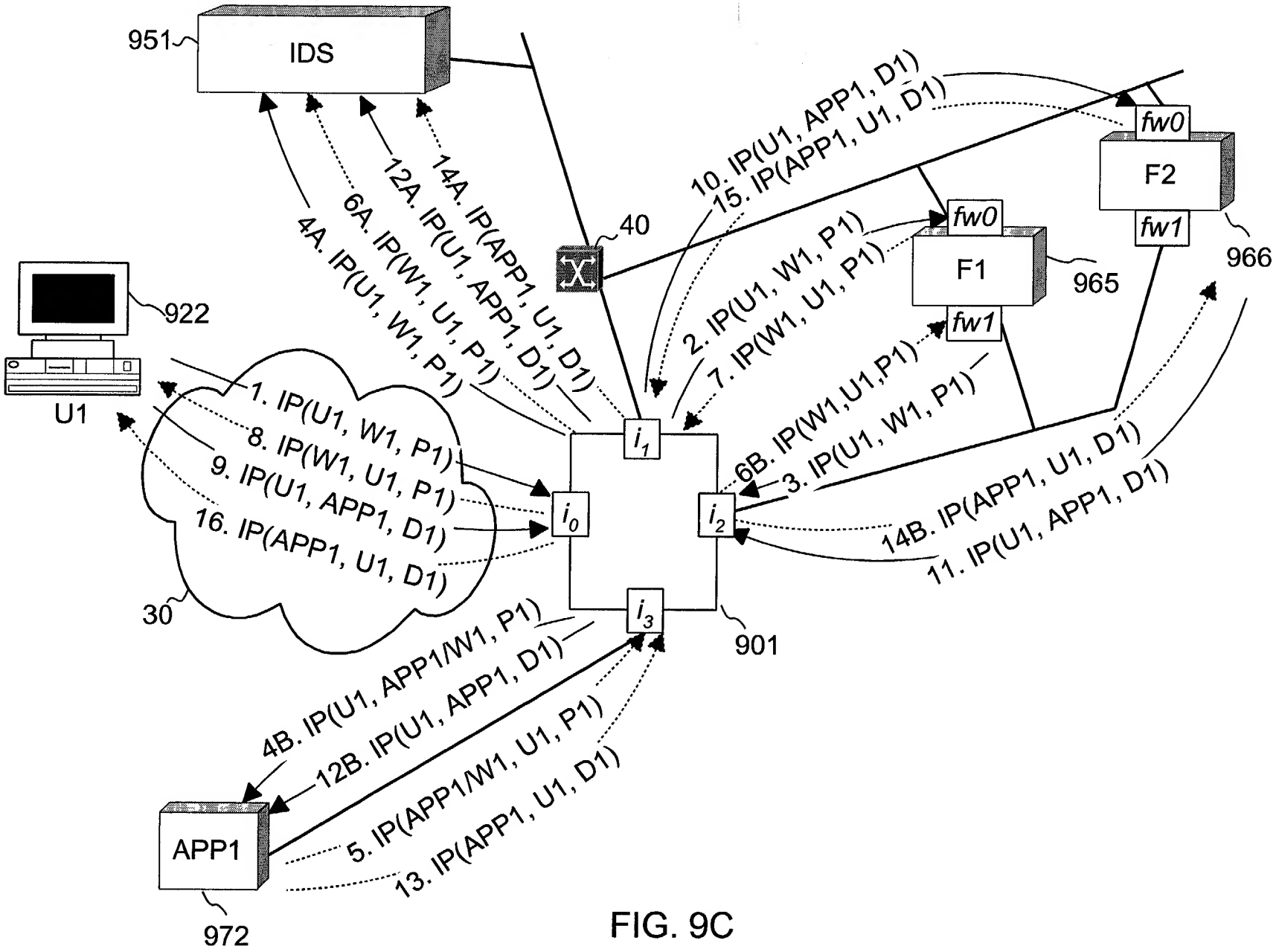


FIG. 9C

STEP	FROM	TO	SOURCE IP	DESTINATION IP	PORT
1	U1 (CLIENT)	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	F1 (INT. FW0)	U1	W1	P1
3	F1 (INT. FW1)	PACKETING ENGINE	U1	W1	P1
4A	PACKETING ENGINE	IDS	U1	W1	P1
4B	PACKETING ENGINE	APP1	U1	APP1 (IF NAT REQUIRED); W1 (IF LOOPBACK OR ALIAS SUPPORTED BY APP1)	P1
5	APP1	PACKETING ENGINE	APP1 (IF NAT REQUIRED); W1 (IF LOOPBACK OR ALIAS SUPPORTED BY APP1)	U1	P1
6A	PACKETING ENGINE	IDS	W1	U1	P1
6B	PACKETING ENGINE	F1 (INT. FW1)	W1	U1	P1
7	F1 (INT. FW0)	PACKETING ENGINE	W1	U1	P1
8	PACKETING ENGINE	U1	W1	U1	P1
9	U1 (CLIENT)	PACKETING ENGINE	U1	APP1	D1
10	PACKETING ENGINE	F2 (INT. FW0)	U1	APP1	D1
11	F2 (INT. FW1)	PACKETING ENGINE	U1	APP1	D1
12A	PACKETING ENGINE	IDS	U1	APP1	D1
12B	PACKETING ENGINE	APP1	U1	APP1	D1
13	APP1	PACKETING ENGINE	APP1	U1	D1
14A	PACKETING ENGINE	IDS	APP1	U1	D1
14B	PACKETING ENGINE	F2 (INT. FW1)	APP1	U1	D1
15	F2 (INT. FW0)	PACKETING ENGINE	APP1	U1	D1
16	PACKETING ENGINE	U1	APP1	U1	D1

934

FIG. 9D

TABLES MAINTAINED BY PACKETING ENGINE								
RECEIVE PACKET INBOUND TO PACKETING ENGINE					SEND IT OUTBOUND FROM PACKETING ENGINE			
RCX ON INT.	SOURCE ADDRESS		DEST. IP ADDRESS	SERVICE PORT	SEND VIA INT.	DEST. SYSTEM TYPE	SEND PACKET TO	
	MAC	IP					MAC	IP
I_0			W1	P1	I_1	TRANSPARENT	$F1(FW0)_M$	W1
I_2	$F1(FW1)_M$		W1	P1	I_1	TRANSPARENT	IDS_M	W1
					I_3	LOOPBACK	$APP1_M$	W1
						ALIAS	$APP1_M$	W1
						NAT		APP1
I_1	IDS_M			P1	I_3	LOOPBACK	$APP1_M$	W1
						ALIAS	$APP1_M$	W1
						NAT		APP1
I_3	$APP1_M$	APP1 OR W1		P1	I_1	TRANSPARENT	IDS_M	
					I_2	TRANSPARENT	$F1(FW1)_M$	
I_1	$F1(FW0)_M$	W1		P1	I_0	ROUTER		DEFAULT ROUTE
I_0			APP1	PORT>1024	I_1	TRANSPARENT	$F2(FW0)_M$	APP1
I_2	$F2(FW1)_M$		APP1	PORT>1024	I_1	TRANSPARENT	IDS_M	APP1
					I_3	SERVER IP ADDRESS	$APP1_M$	APP1
I_1	IDS_M			PORT>1024	I_3	SERVER IP ADDRESS	$APP1_M$	APP1
I_3	$APP1_M$	APP1		PORT>1024	I_1	TRANSPARENT	IDS_M	
					I_2	TRANSPARENT	$F2(FW1)_M$	
I_1	$F2(FW0)_M$	APP1		PORT>1024	I_0	ROUTER		DEFAULT ROUTE

935

FIG. 9E

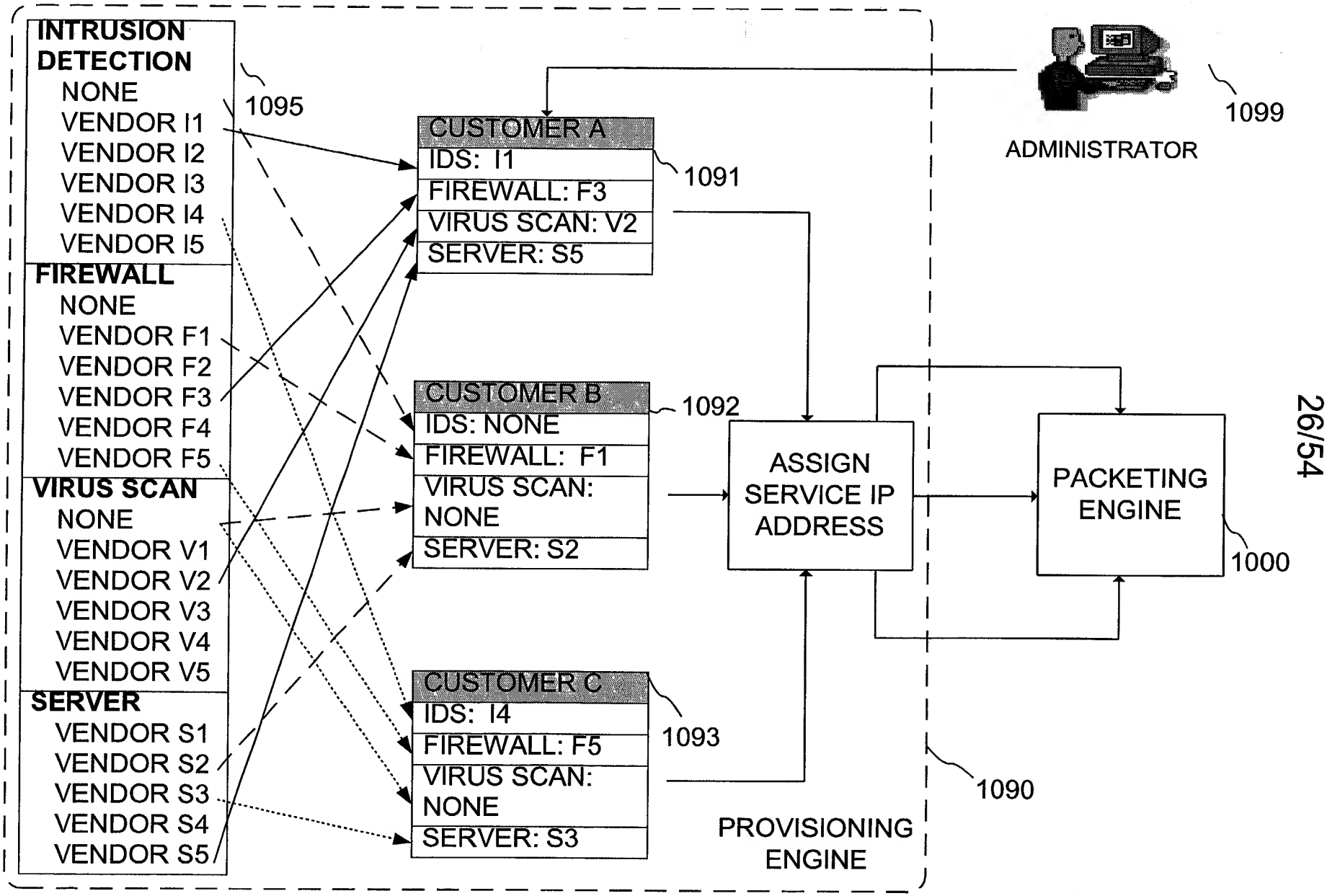

INTRUSION DETECTION
NONE
VENDOR I1
VENDOR I2
VENDOR I3
VENDOR I4
VENDOR I5
FIREWALL
NONE
VENDOR F1
VENDOR F2
VENDOR F3
VENDOR F4
VENDOR F5
VIRUS SCAN
NONE
VENDOR V1
VENDOR V2
VENDOR V3
VENDOR V4
VENDOR V5
SERVER
VENDOR S1
VENDOR S2
VENDOR S3
VENDOR S4
VENDOR S5
1095
CUSTOMER A
IDS: I1
FIREWALL: F3
VIRUS SCAN: V2
SERVER: S5
1091
CUSTOMER B
IDS: NONE
FIREWALL: F1
VIRUS SCAN: NONE
SERVER: S2
1092
CUSTOMER C
IDS: I4
FIREWALL: F5
VIRUS SCAN: NONE
SERVER: S3
1093
ASSIGN SERVICE IP ADDRESS
PACKETING ENGINE
1000
PROVISIONING ENGINE
1090
ADMINISTRATOR
1099

FIG. 10

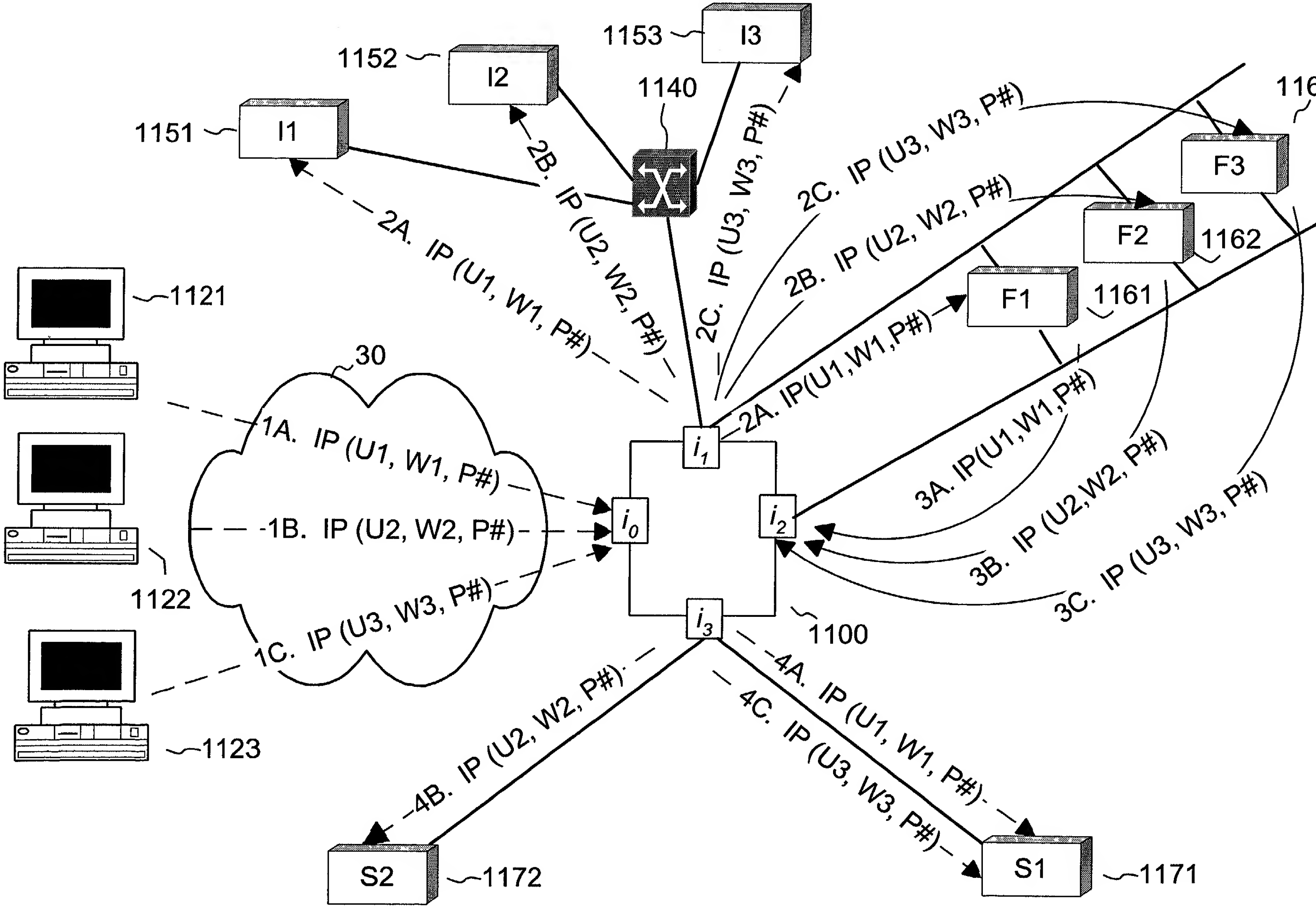

1151
I1
1152
I2
1153
I3
1140
1163
F3
F2
1162
F1
1161
1121
1122
1123
30
1A. IP (U1, W1, P#)
-1B. IP (U2, W2, P#)
1C. IP (U3, W3, P#)
i0
i1
i2
i3
1100
2A. IP (U1, W1, P#)
2B. IP (U2, W2, P#)
2C. IP (U3, W3, P#)
2A. IP(U1,W1,P#)
2B. IP (U2, W2, P#)
2C. IP (U3, W3, P#)
3A. IP(U1,W1,P#)
3B. IP (U2,W2, P#)
3C. IP (U3, W3, P#)
4A. IP (U1, W1, P#)
4B. IP (U2, W2, P#)
4C. IP (U3, W3, P#)
S1
1171
S2
1172

FIG. 11

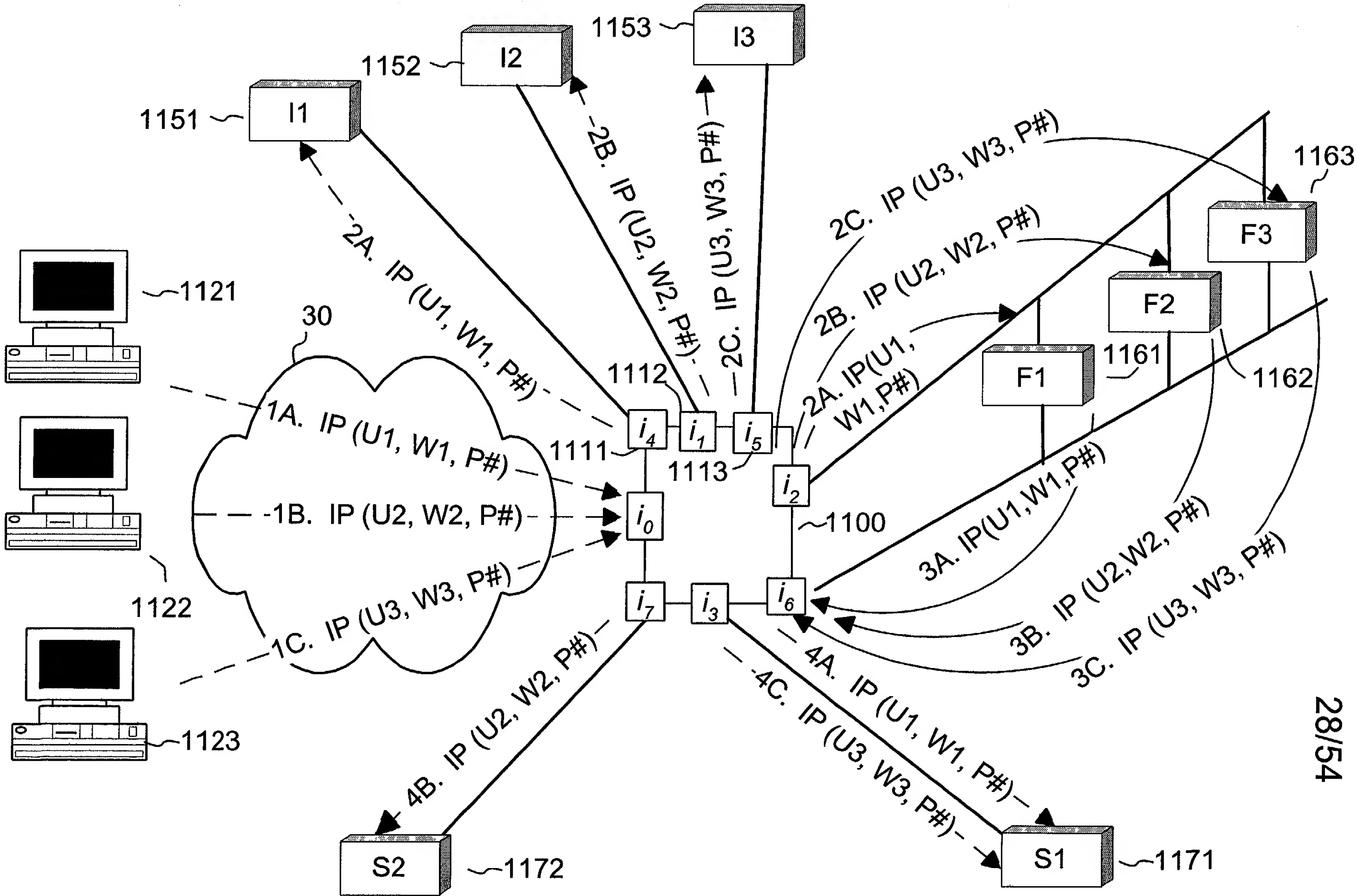

1151
I1
1152
I2
1153
I3
1163
F3
F2
F1
1161
1162
1121
1122
1123
30
1A. IP (U1, W1, P#)
1B. IP (U2, W2, P#)
1C. IP (U3, W3, P#)
2A. IP (U1, W1, P#)
2B. IP (U2, W2, P#)
2C. IP (U3, W3, P#)
2C. IP (U3, W3, P#)
2B. IP (U2, W2, P#)
2A. IP(U1, W1,P#)
3A. IP(U1,W1,P#)
3B. IP (U2,W2, P#)
3C. IP (U3, W3, P#)
4A. IP (U1, W1, P#)
4B. IP (U2, W2, P#)
4C. IP (U3, W3, P#)
1111
1112
1113
1100
i_0
i_1
i_2
i_3
i_4
i_5
i_6
i_7
S1
1171
S2
1172

FIG. 11A

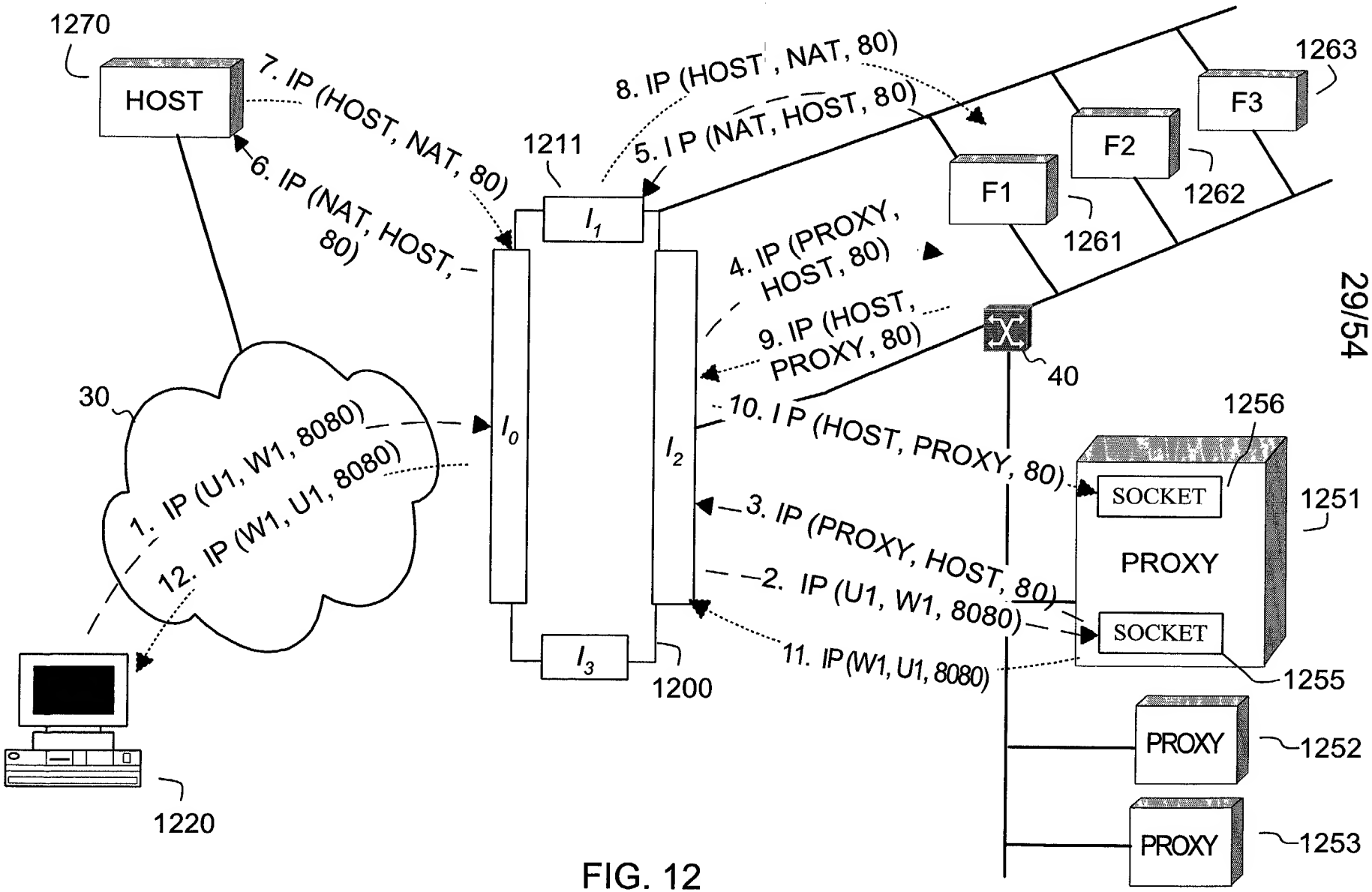

1270
HOST
7. IP (HOST, NAT, 80)
6. IP (NAT, HOST, 80)
1211
I_1
8. IP (HOST , NAT, 80)
5. I P (NAT, HOST, 80)
F1
F2
F3
1261
1262
1263
4. IP (PROXY, HOST, 80)
9. IP (HOST, PROXY, 80)
40
30
1. IP (U1, W1, 8080)
12. IP (W1, U1, 8080)
I_0
I_2
I_3
1200
10. I P (HOST, PROXY, 80)
3. IP (PROXY, HOST, 80)
2. IP (U1, W1, 8080)
11. IP (W1, U1, 8080)
1256
SOCKET
PROXY
SOCKET
1251
1255
PROXY
1252
PROXY
1253
1220

FIG. 12

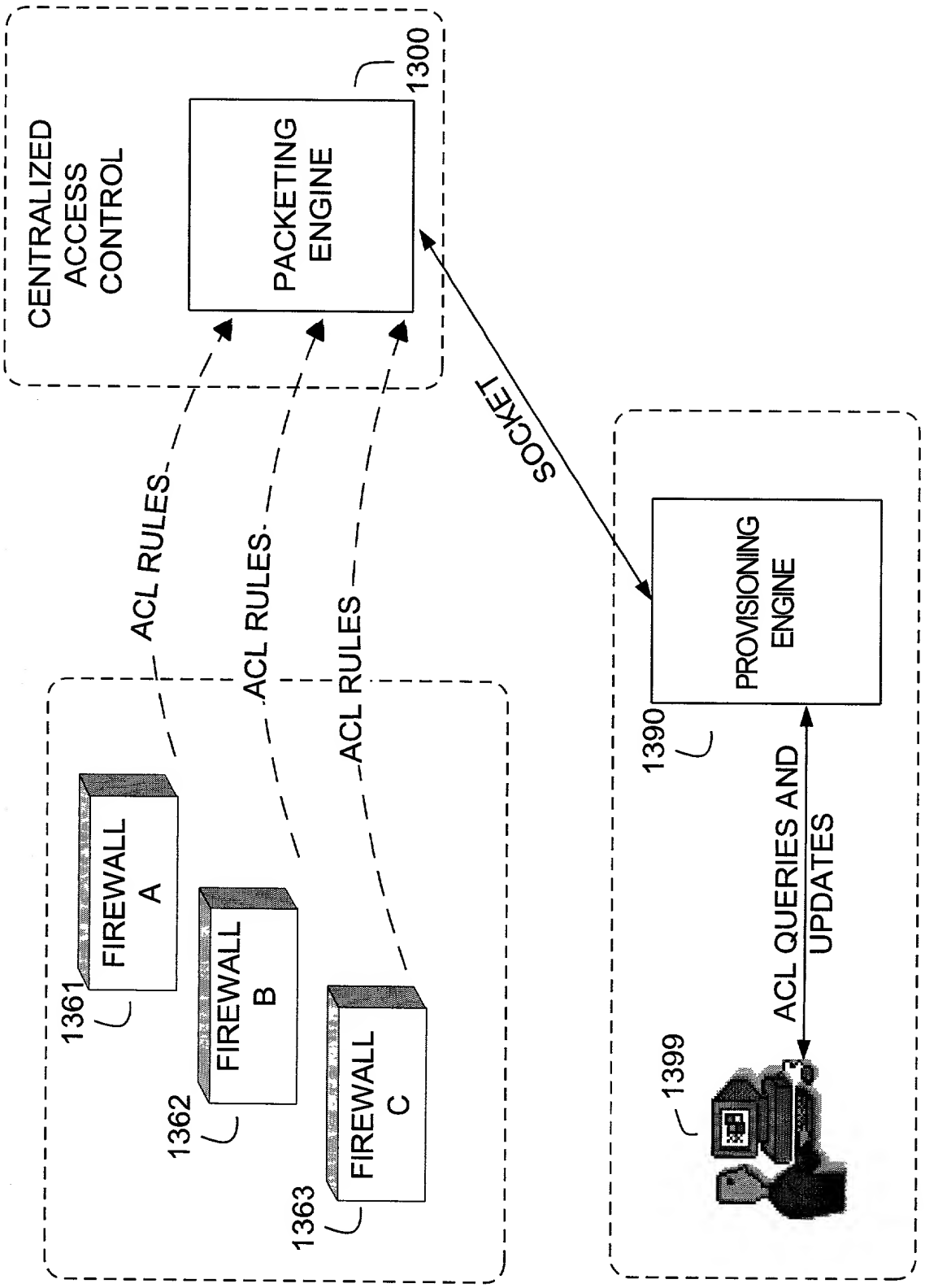

CENTRALIZED ACCESS CONTROL
PACKETING ENGINE
1300
ACL RULES
ACL RULES
ACL RULES
SOCKET
FIREWALL A
FIREWALL B
FIREWALL C
1361
1362
1363
PROVISIONING ENGINE
1390
ACL QUERIES AND UPDATES
1399

FIG. 13

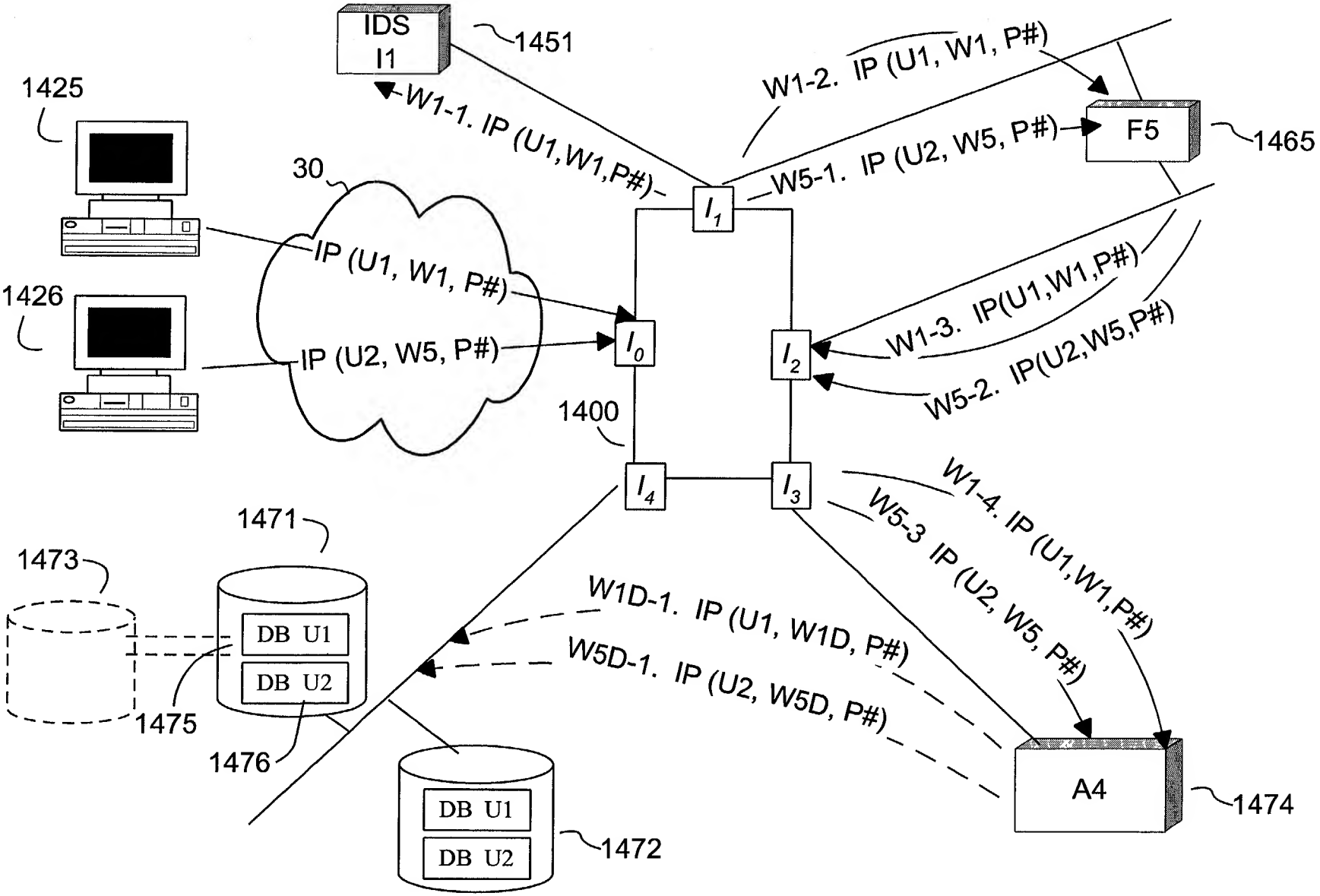

IDS
I1
1451
1425
W1-1. IP (U1,W1,P#)
W1-2. IP (U1, W1, P#)
F5
1465
W5-1. IP (U2, W5, P#)
30
IP (U1, W1, P#)
1426
IP (U2, W5, P#)
I_1
I_0
I_2
W1-3. IP(U1,W1,P#)
W5-2. IP(U2,W5,P#)
1400
I_4
I_3
W1-4. IP (U1,W1,P#)
W5-3 IP (U2, W5, P#)
1471
1473
W1D-1. IP (U1, W1D, P#)
W5D-1. IP (U2, W5D, P#)
DB U1
DB U2
1475
1476
DB U1
DB U2
1472
A4
1474

FIG. 14

SERVICE IP ADDRESS W1

STEP W1-1	INTRUSION DETECTION	I1
STEP W1-2/3	FIREWALL	F5
STEP W1-4	APPLICATION SERVER	A4

1431

FIG. 14A

SERVICE IP ADDRESS W5

STEP W5-1/2	FIREWALL	F5
STEP W5-3	APPLICATION SERVER	A4

1432

FIG. 14B

SERVICE IP ADDRESS W1D

STEP W1D-1	DATABASE SERVER	D1

1433

FIG. 14C

SERVICE IP ADDRESS W5D

STEP W5D-1	DATABASE SERVER	D1

1434

FIG. 14D

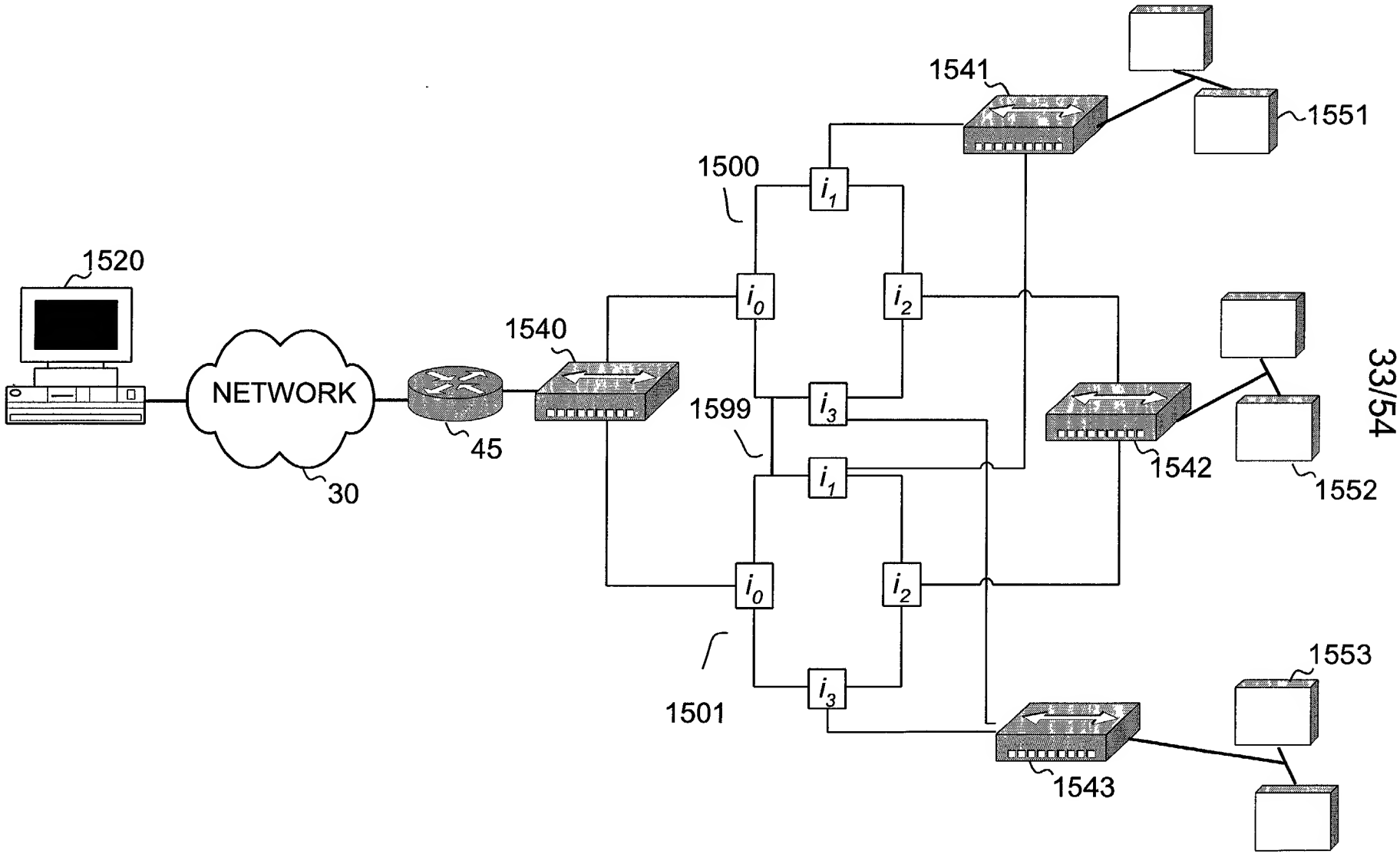

1520
NETWORK
30
45
1540
1500
1599
1501
1541
1551
1542
1552
1553
1543
i_0
i_1
i_2
i_3

FIG. 15

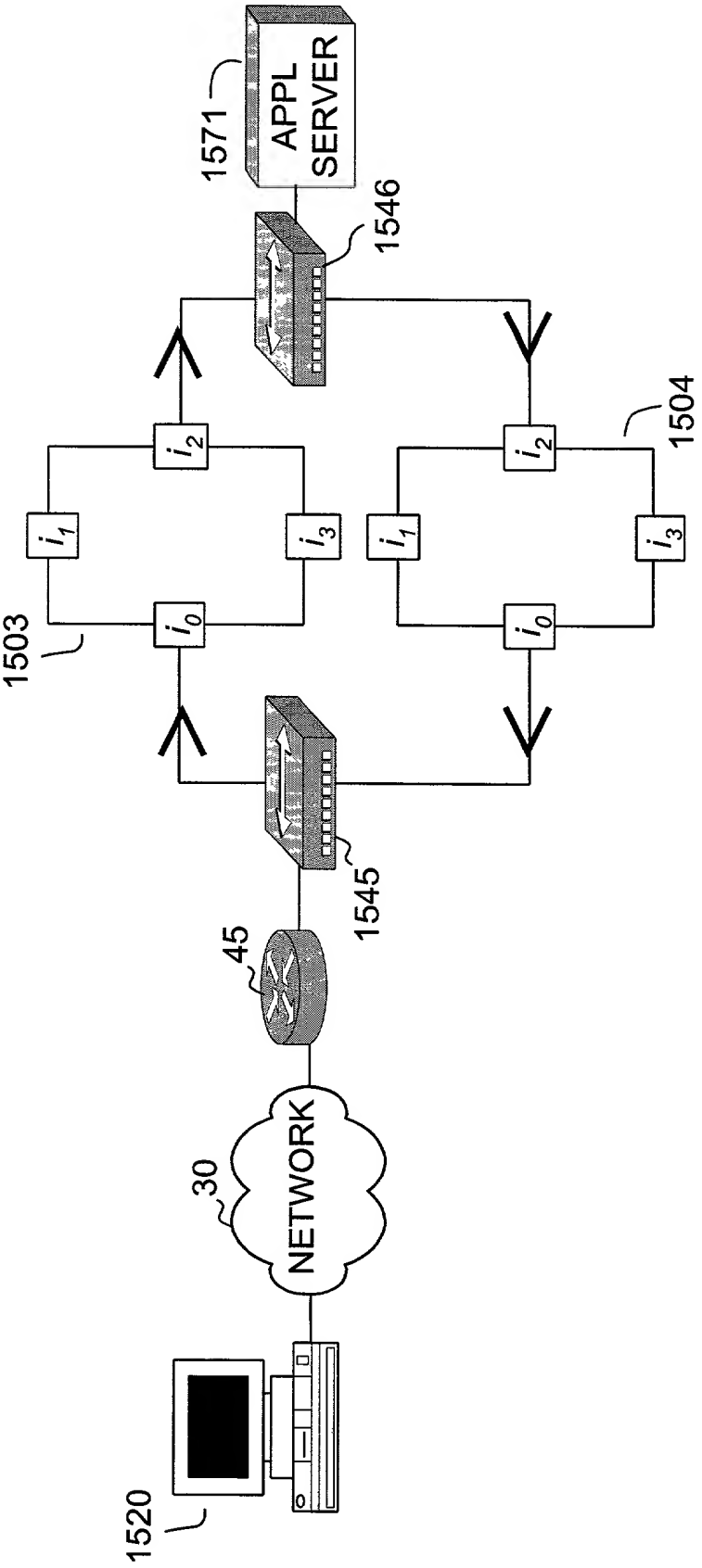

1571
APPL SERVER
1546
1504
1503
i_0
i_1
i_2
i_3
1545
45
30
NETWORK
1520

FIG. 15A

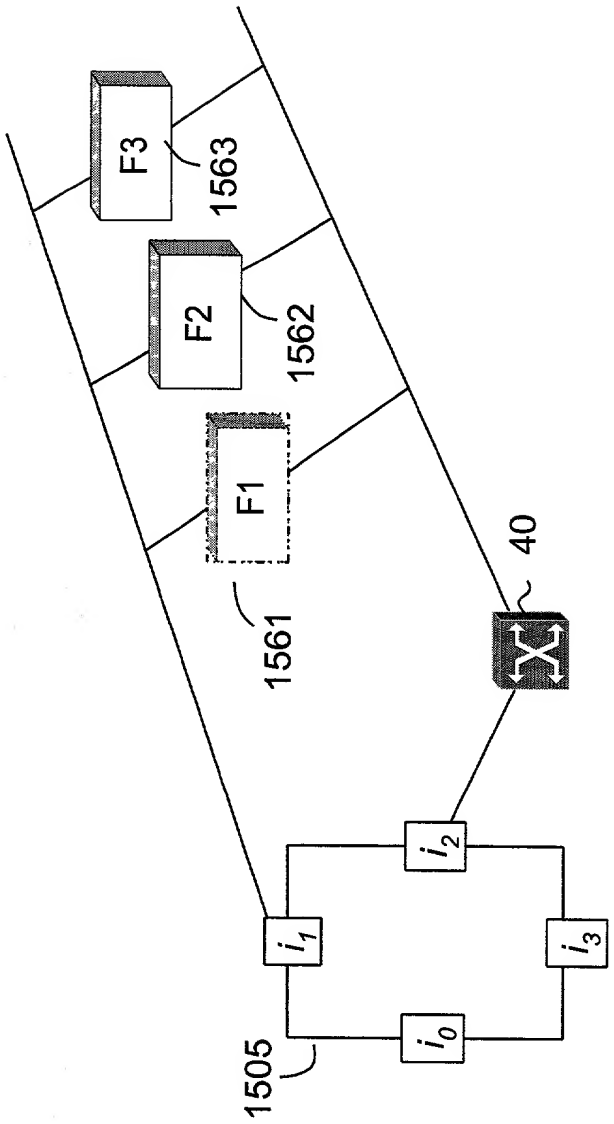


FIG. 15B

1533

SEND IT OUTBOUND FROM PACKETING ENGINE				
SEND FROM INTERFACE	DEST. SYSTEM TYPE	SEND PACKET TO		
		MAC	IP	
I_{11}	TRANSPARENT	FIREWALL $F1_M$	W1	
I_1	TRANSPARENT	FIREWALL $F2_M$	W1	

FIG. 15C

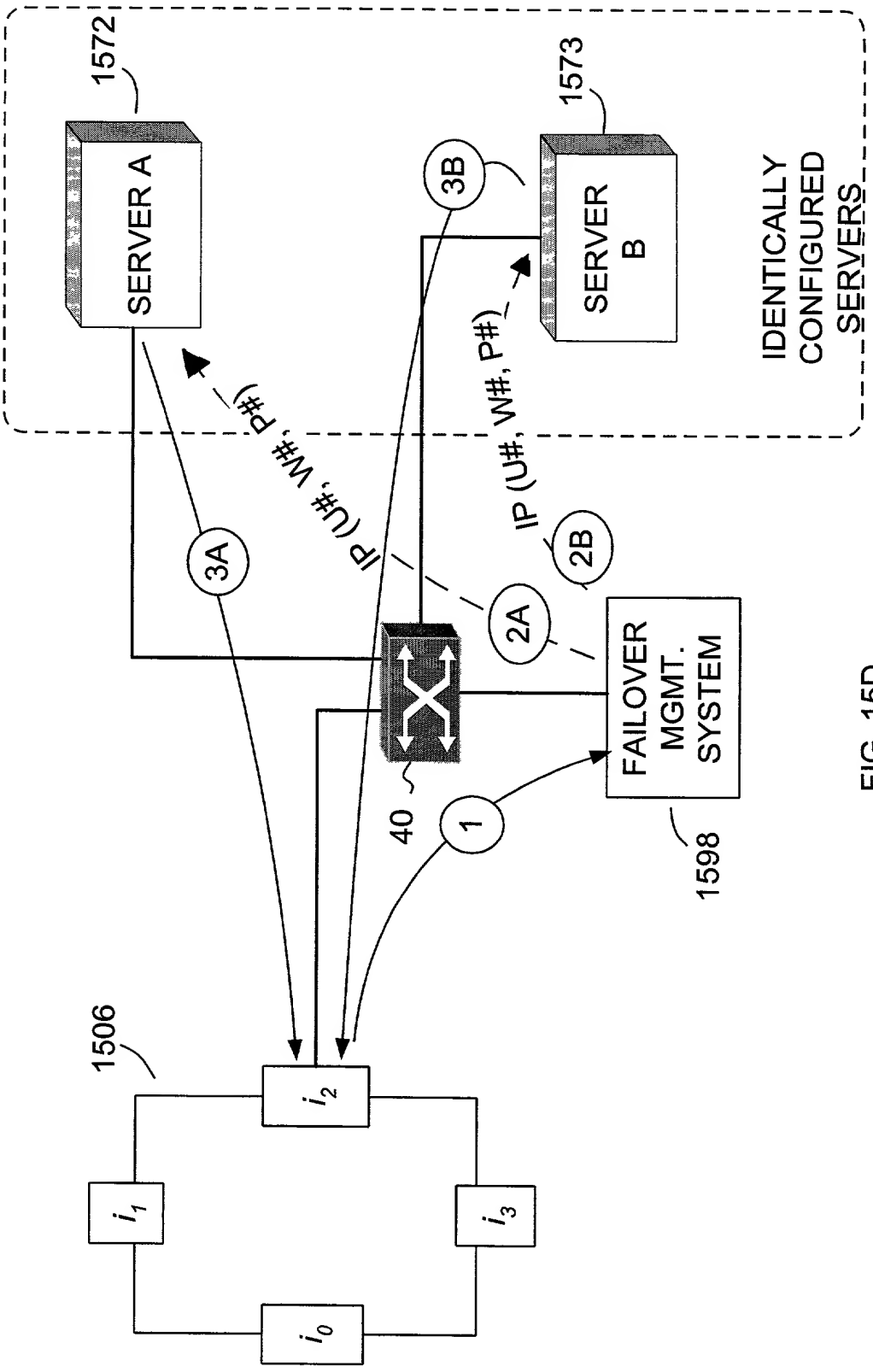

1572
SERVER A
1573
SERVER B
IDENTICALLY CONFIGURED SERVERS
3B
3A
IP (U#, W#, P#)
IP (U#, W#, P#)
2B
2A
FAILOVER MGMT. SYSTEM
1598
40
1
1506
i_2
i_1
i_3
i_0

FIG. 15D

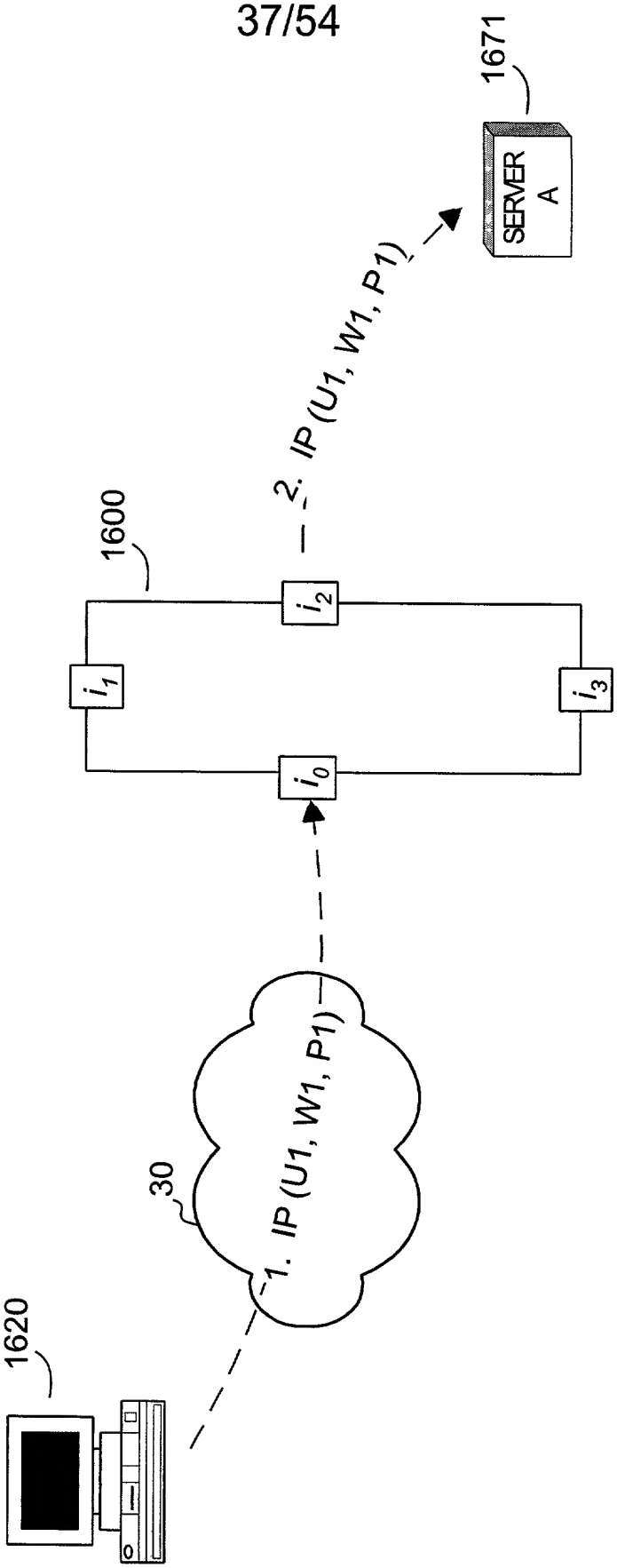


FIG. 16

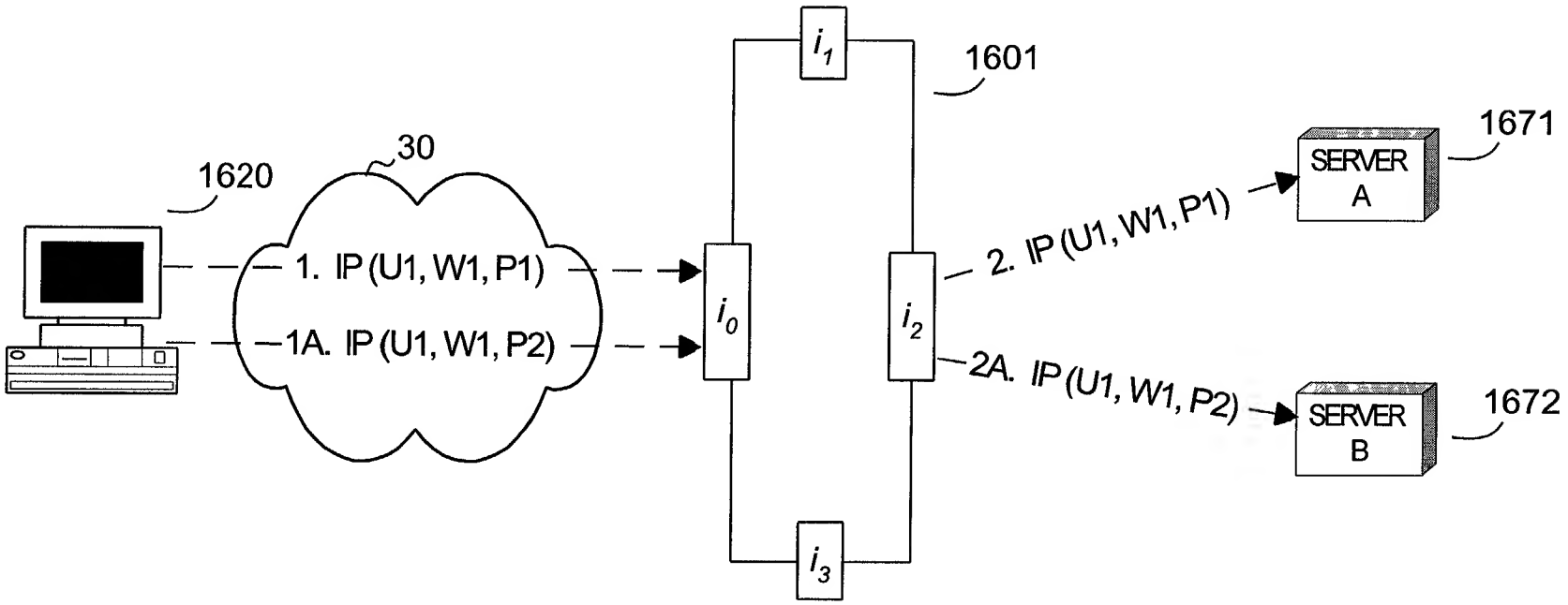

1620
30
1. IP (U1, W1, P1)
1A. IP (U1, W1, P2)
i_0
i_1
i_2
i_3
1601
2. IP (U1, W1, P1)
2A. IP (U1, W1, P2)
SERVER A
SERVER B
1671
1672

FIG. 16A

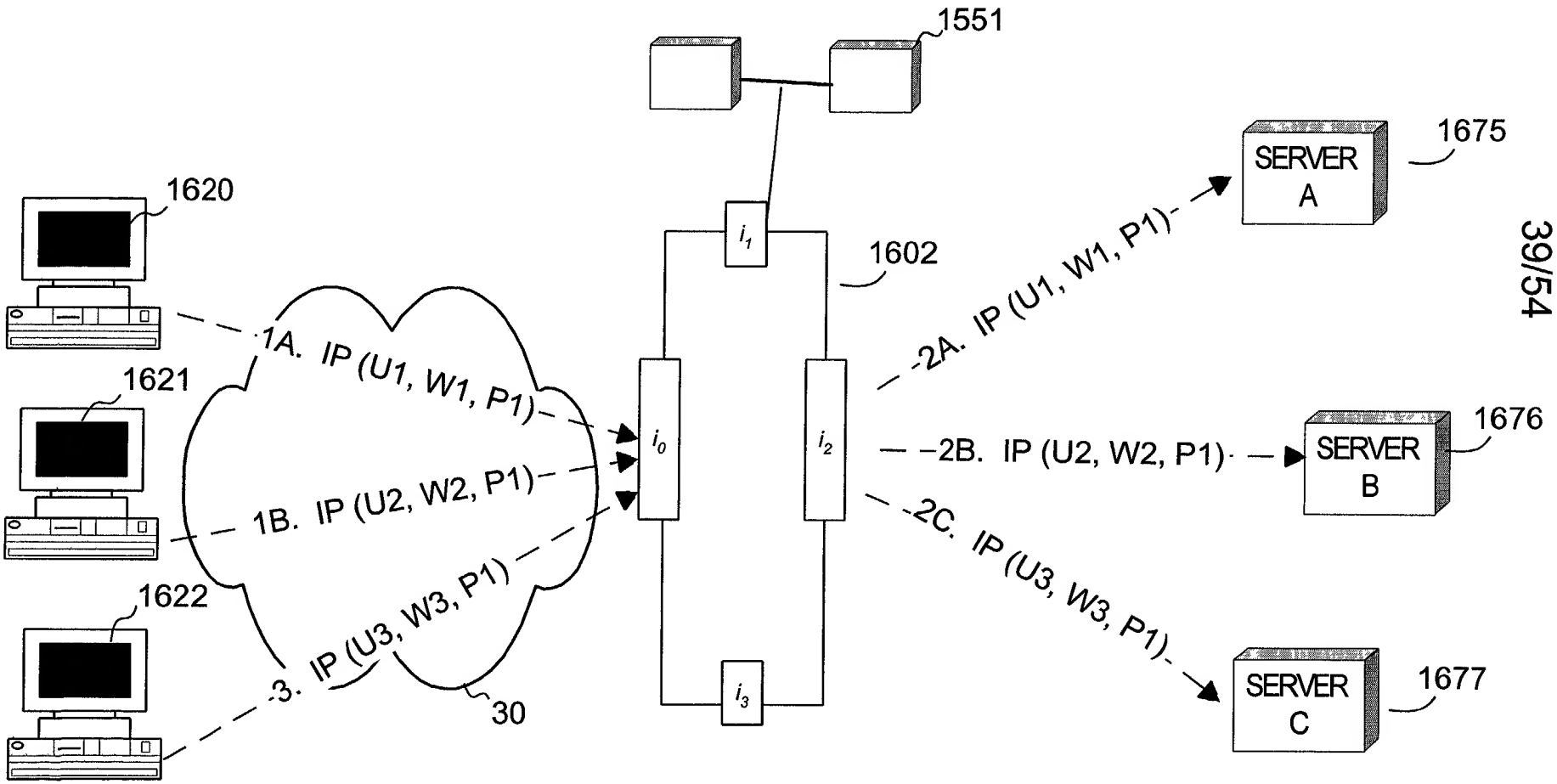

1551
1620
1621
1622
1602
1675
1676
1677
SERVER A
SERVER B
SERVER C
i_0
i_1
i_2
i_3
1A. IP (U1, W1, P1)
1B. IP (U2, W2, P1)
3. IP (U3, W3, P1)
30
2A. IP (U1, W1, P1)
2B. IP (U2, W2, P1)
2C. IP (U3, W3, P1)

FIG. 16B

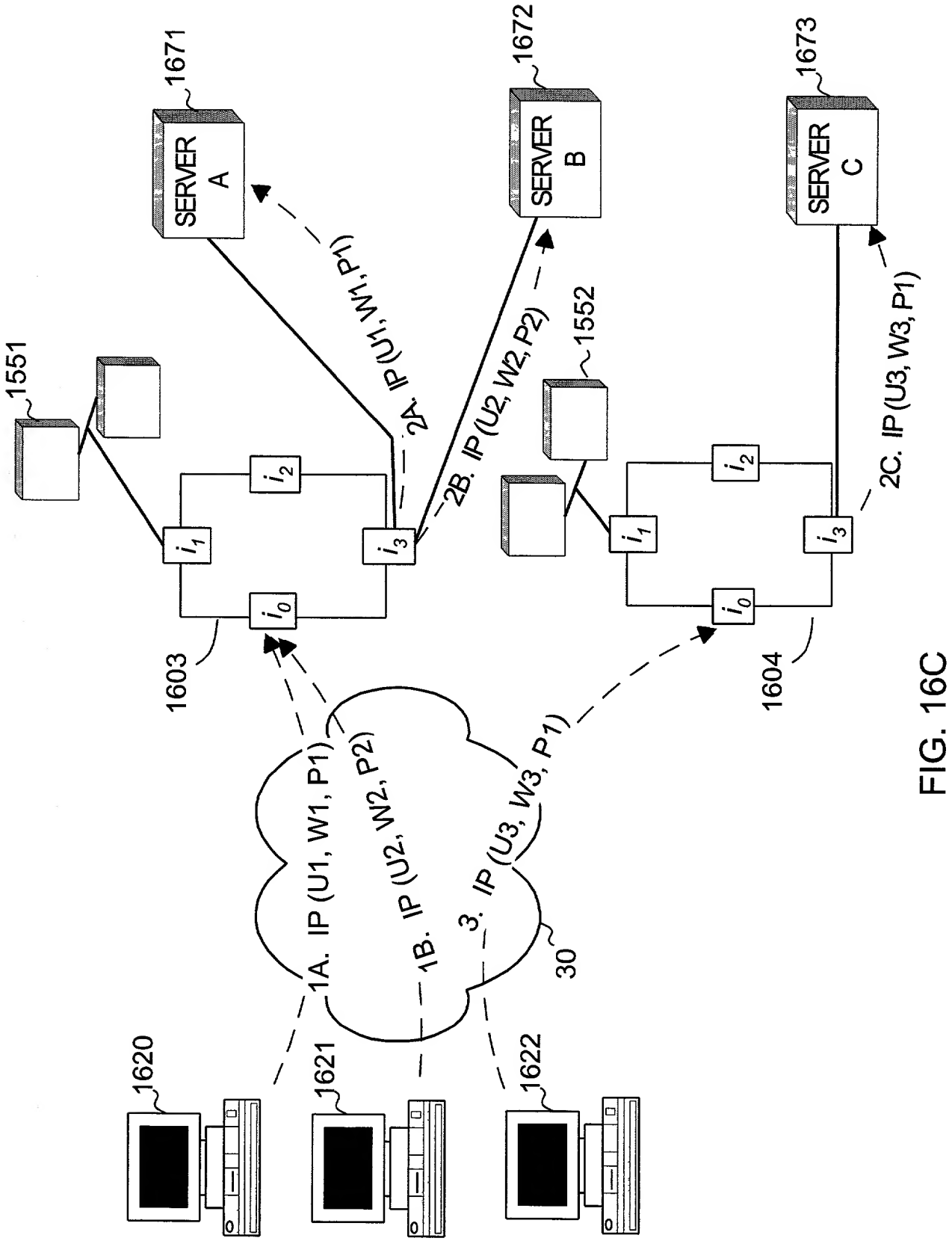

1671
SERVER A
1672
SERVER B
1673
SERVER C
1551
1552
2A. IP (U1, W1, P1)
2B. IP (U2, W2, P2)
2C. IP (U3, W3, P1)
i_0
i_1
i_2
i_3
1603
1604
1A. IP (U1, W1, P1)
1B. IP (U2, W2, P2)
3. IP (U3, W3, P1)
30
1620
1621
1622

FIG. 16C

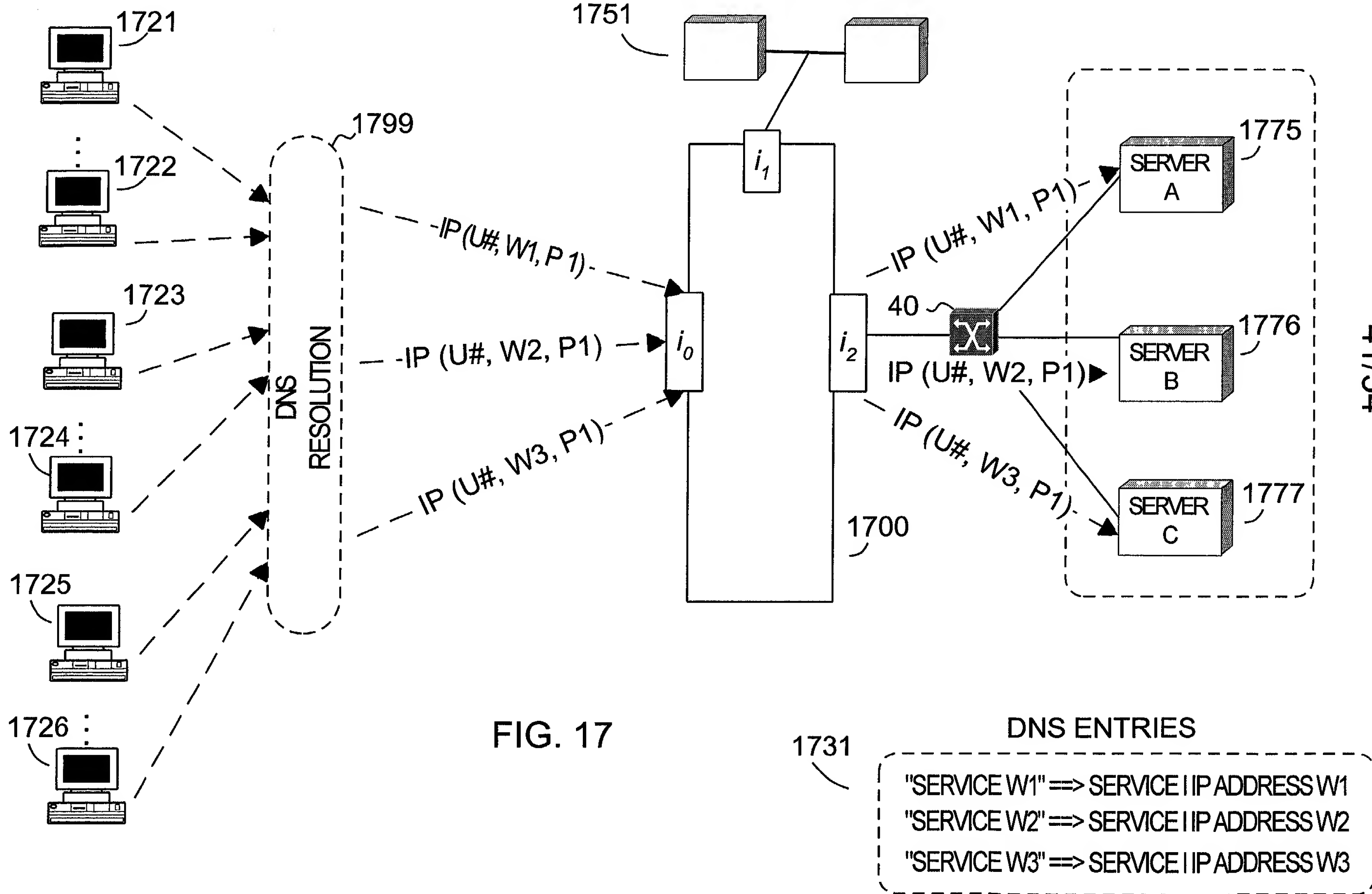


FIG. 17

FIG. 17A

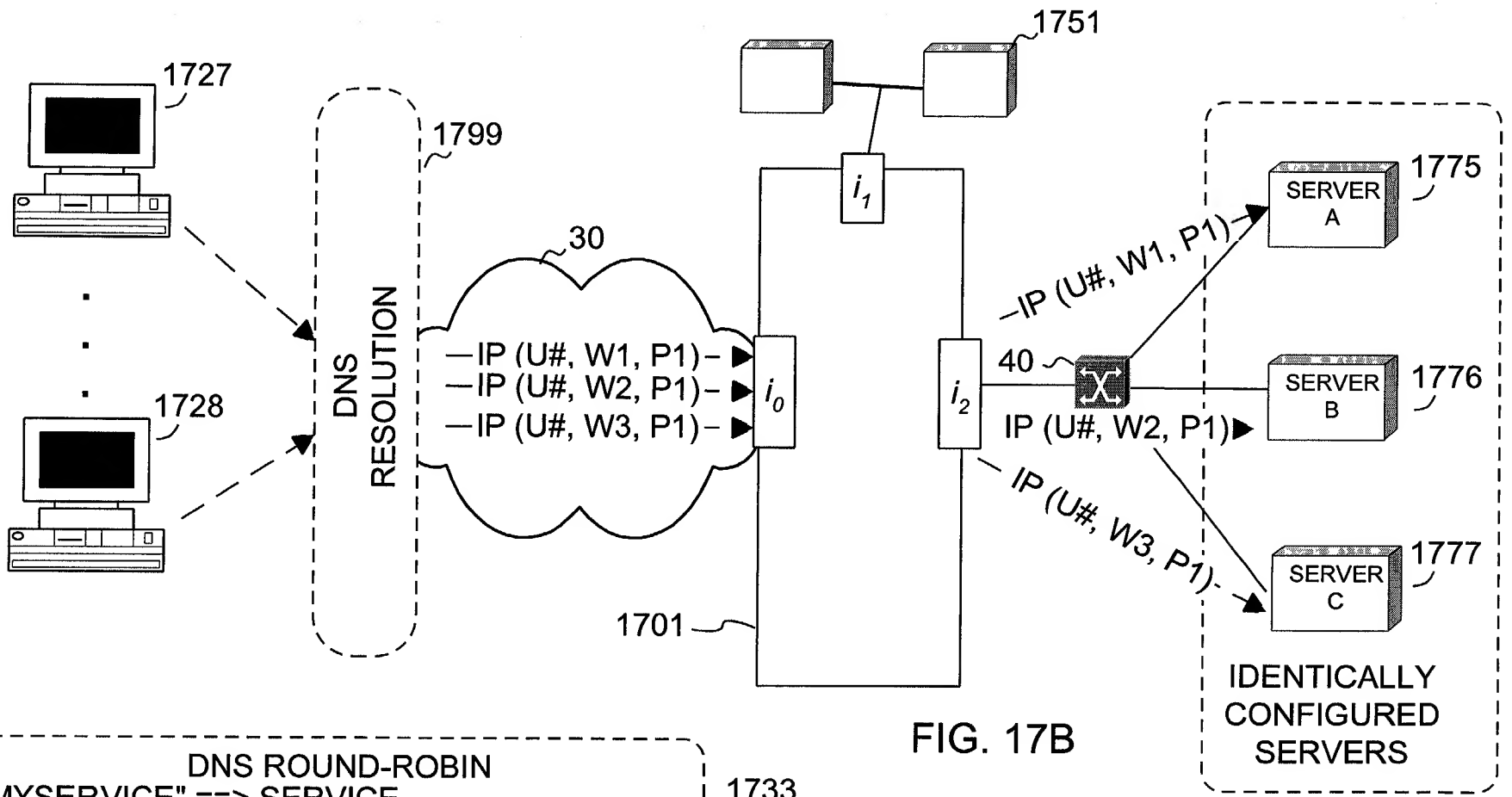


FIG. 17B

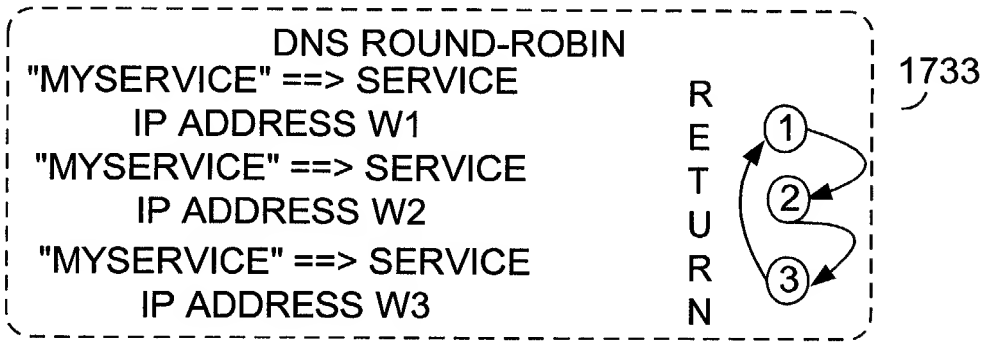


FIG. 17C

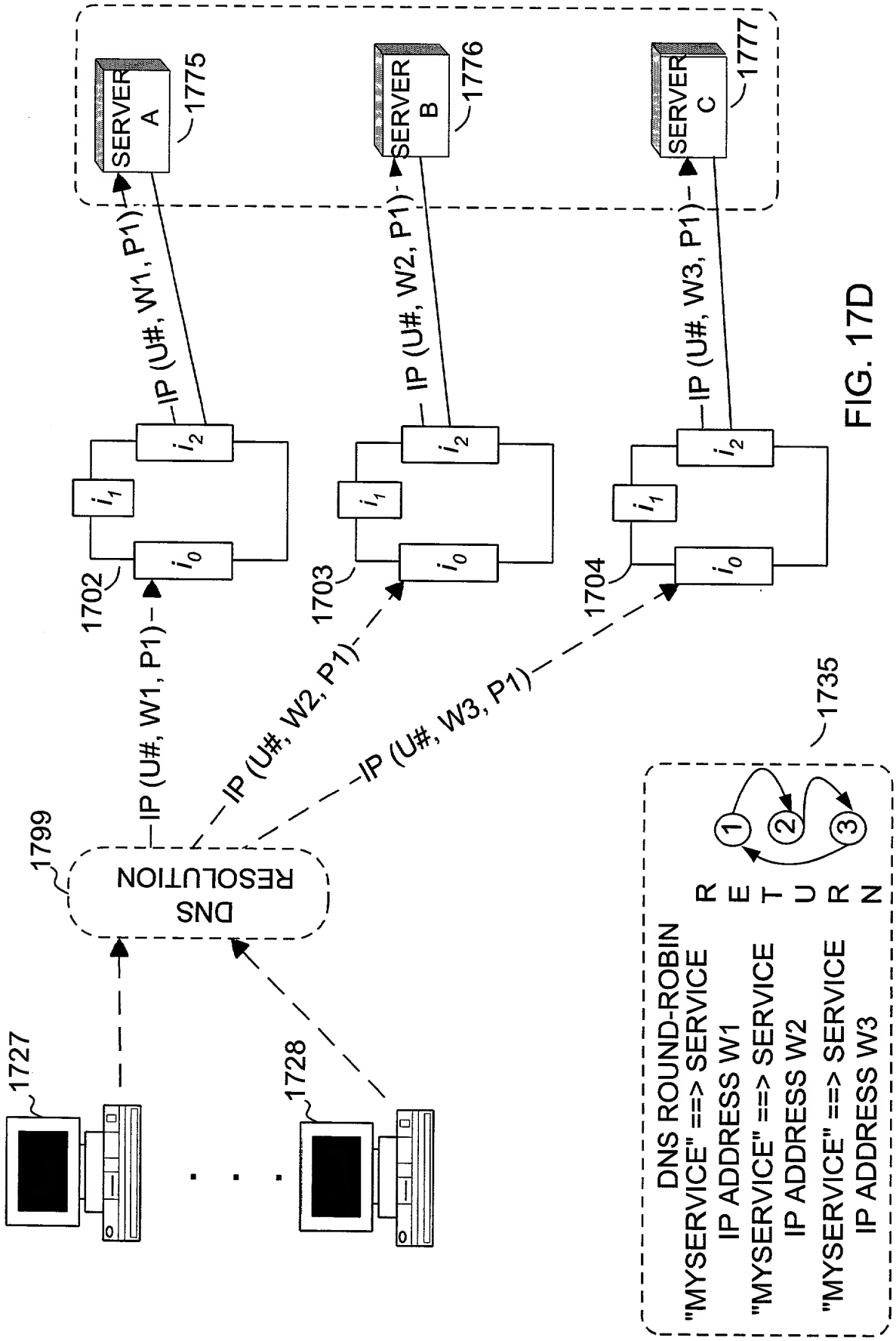


FIG. 17D

FIG. 17E

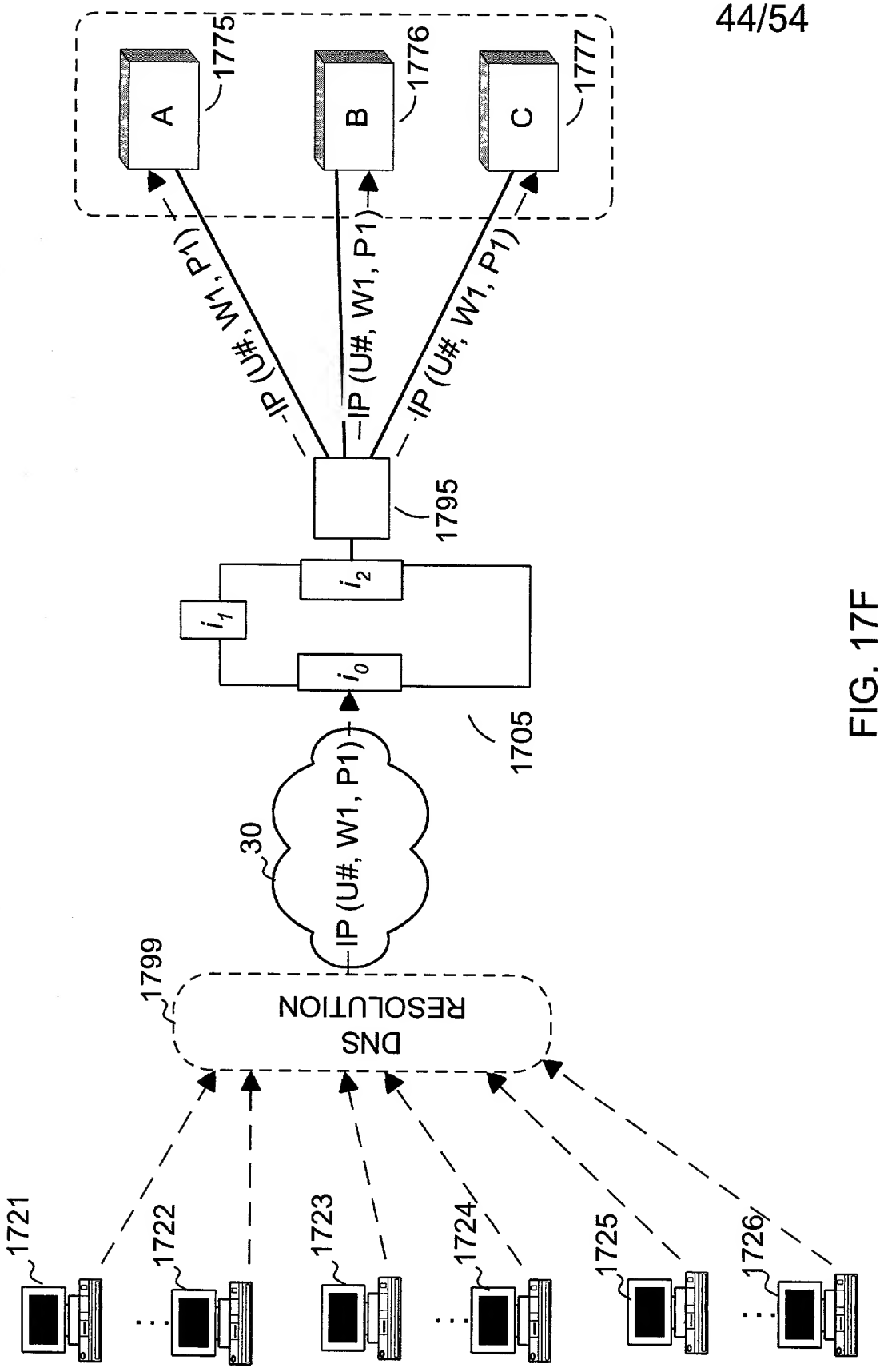

1721
1722
1723
1724
1725
1726
1799
DNS RESOLUTION
30
IP (U#, W1, P1)
1705
i_0
i_1
i_2
1795
IP (U#, W1, P1)
IP (U#, W1, P1)
IP (U#, W1, P1)
A
B
C
1775
1776
1777

FIG. 17F

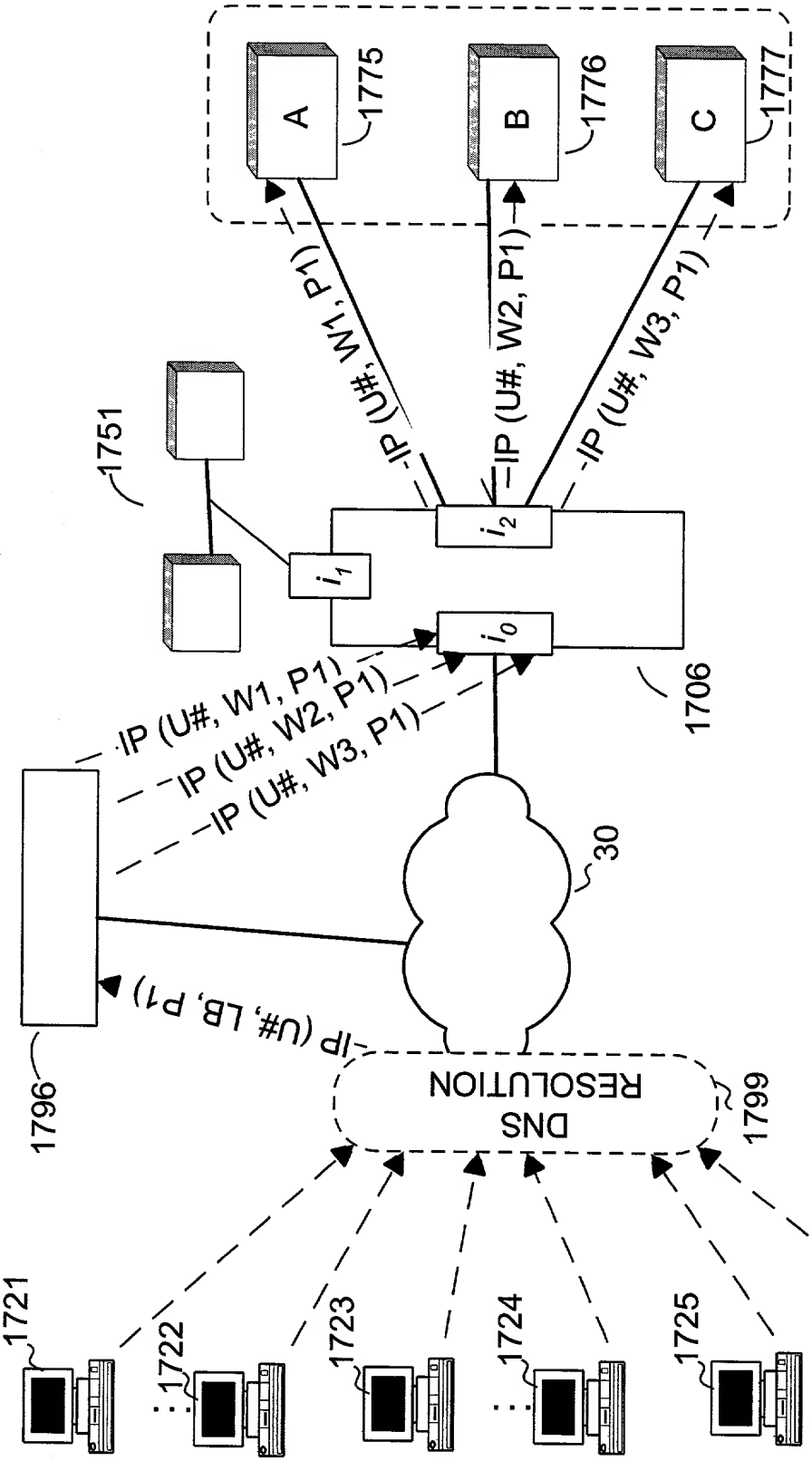


FIG. 17G

DNS ENTRIES
"SERVICE W" ==> LB
1738

FIG. 17H

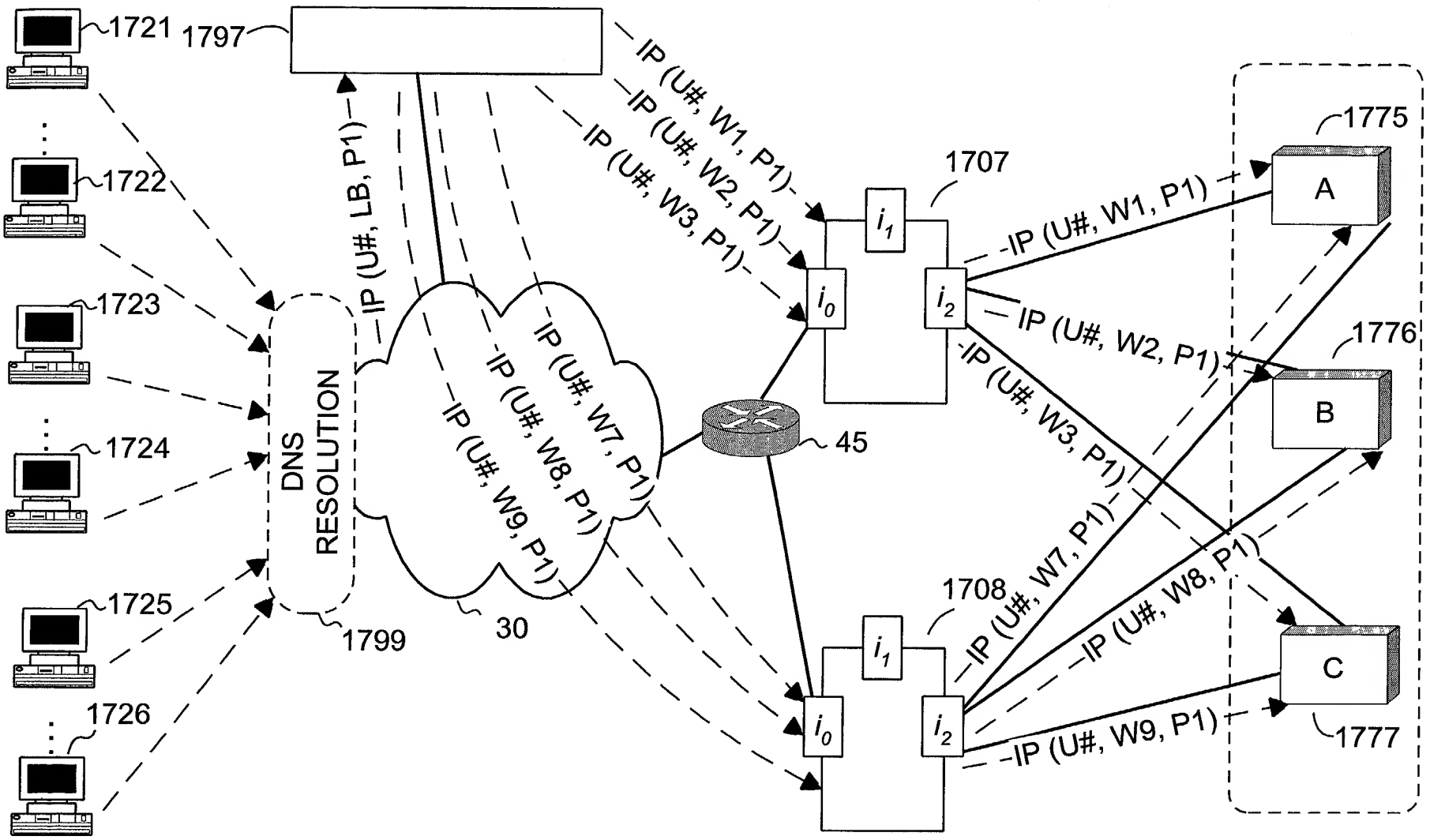

1721
1797
1722
1723
1724
1725
1726
DNS RESOLUTION
1799
IP (U#, LB, P1)
30
IP (U#, W1, P1)
IP (U#, W2, P1)
IP (U#, W3, P1)
IP (U#, W7, P1)
IP (U#, W8, P1)
IP (U#, W9, P1)
45
1707
1708
i_0
i_1
i_2
1775
1776
1777
A
B
C

FIG. 17I

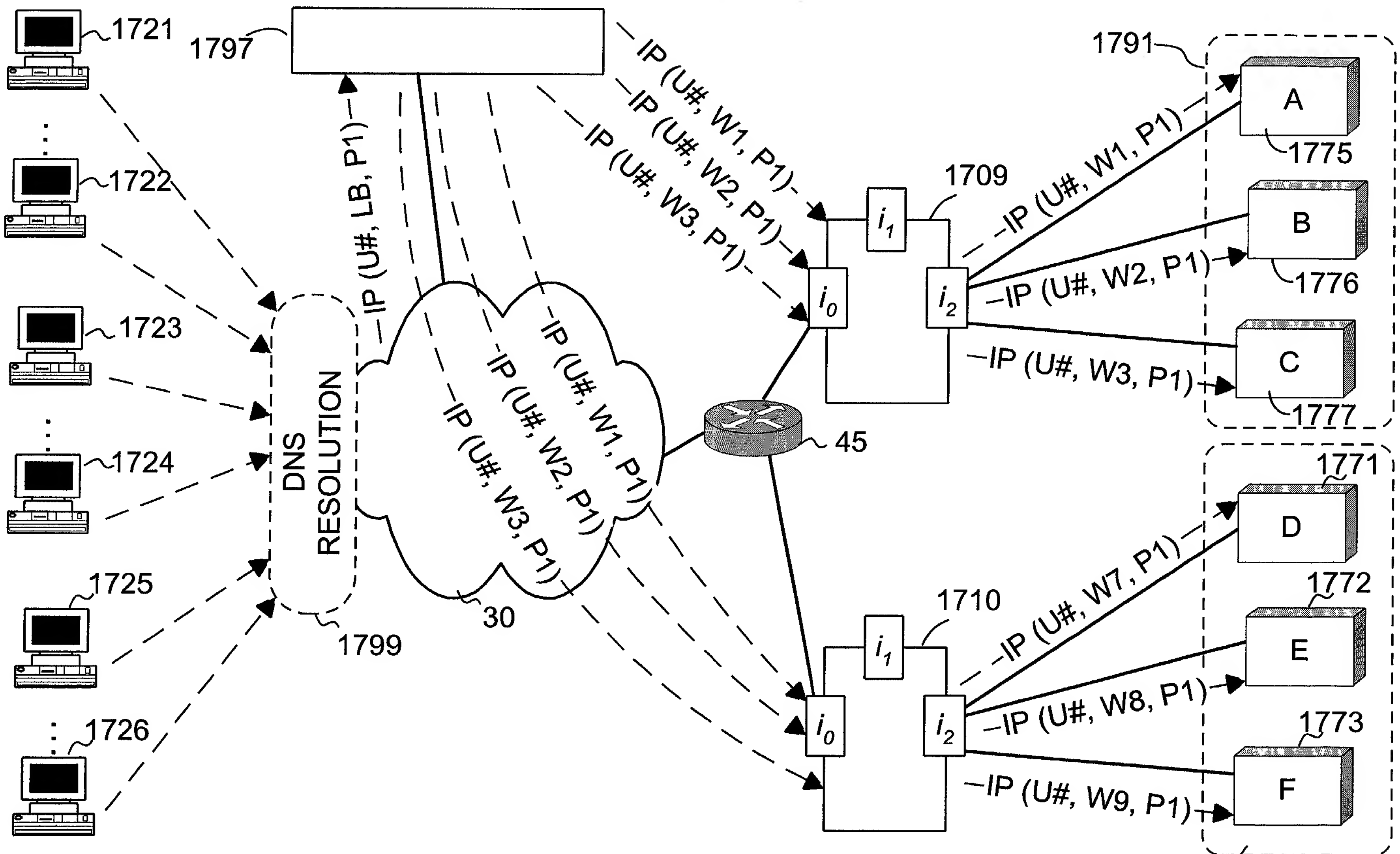

1721
1722
1723
1724
1725
1726
1797
DNS
RESOLUTION
1799
IP (U#, LB, P1)
30
IP (U#, W1, P1)
IP (U#, W2, P1)
IP (U#, W3, P1)
45
1709
1710
i_0
i_1
i_2
IP (U#, W7, P1)
IP (U#, W8, P1)
IP (U#, W9, P1)
1791
1792
A
B
C
D
E
F
1775
1776
1777
1771
1772
1773

FIG. 17J

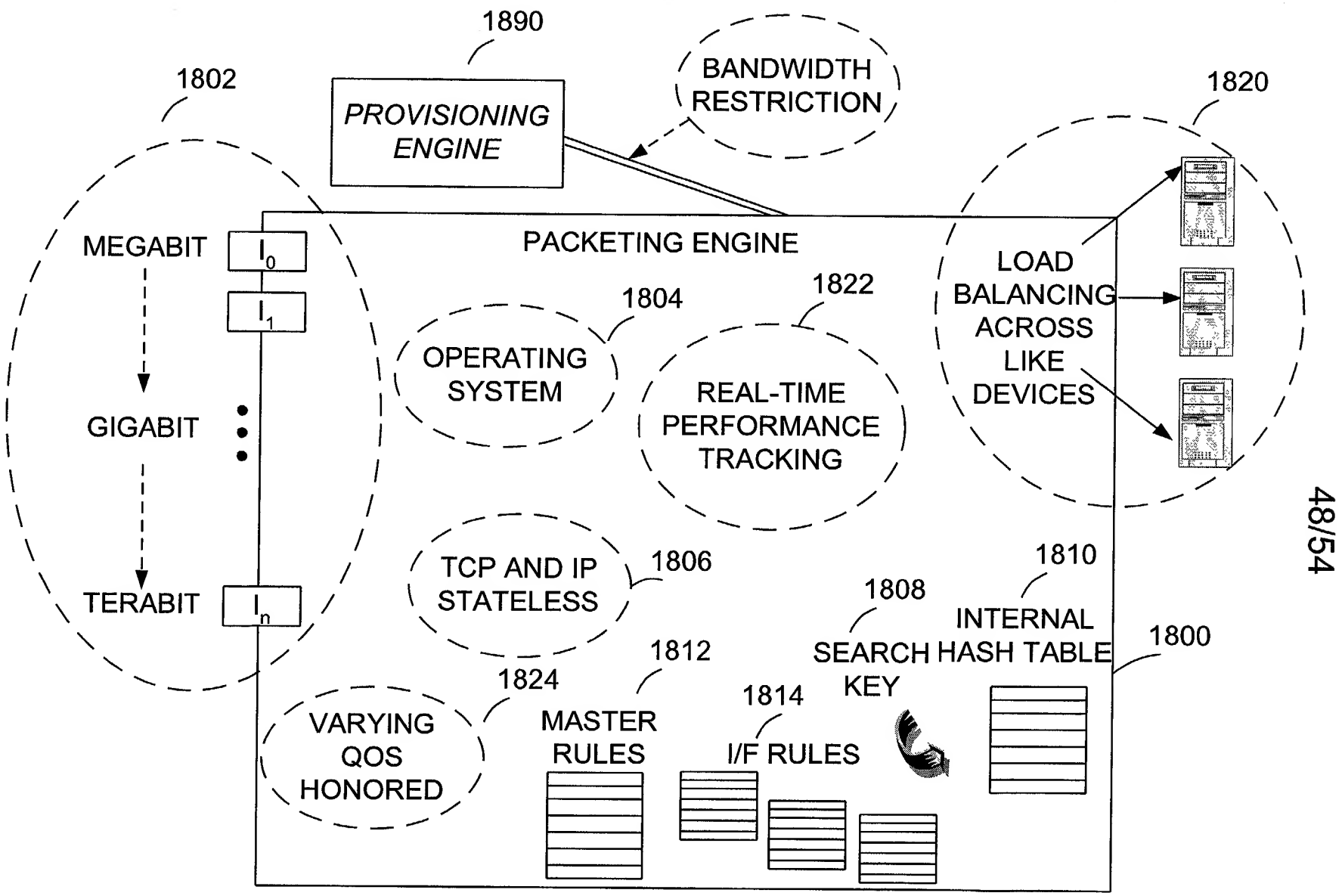
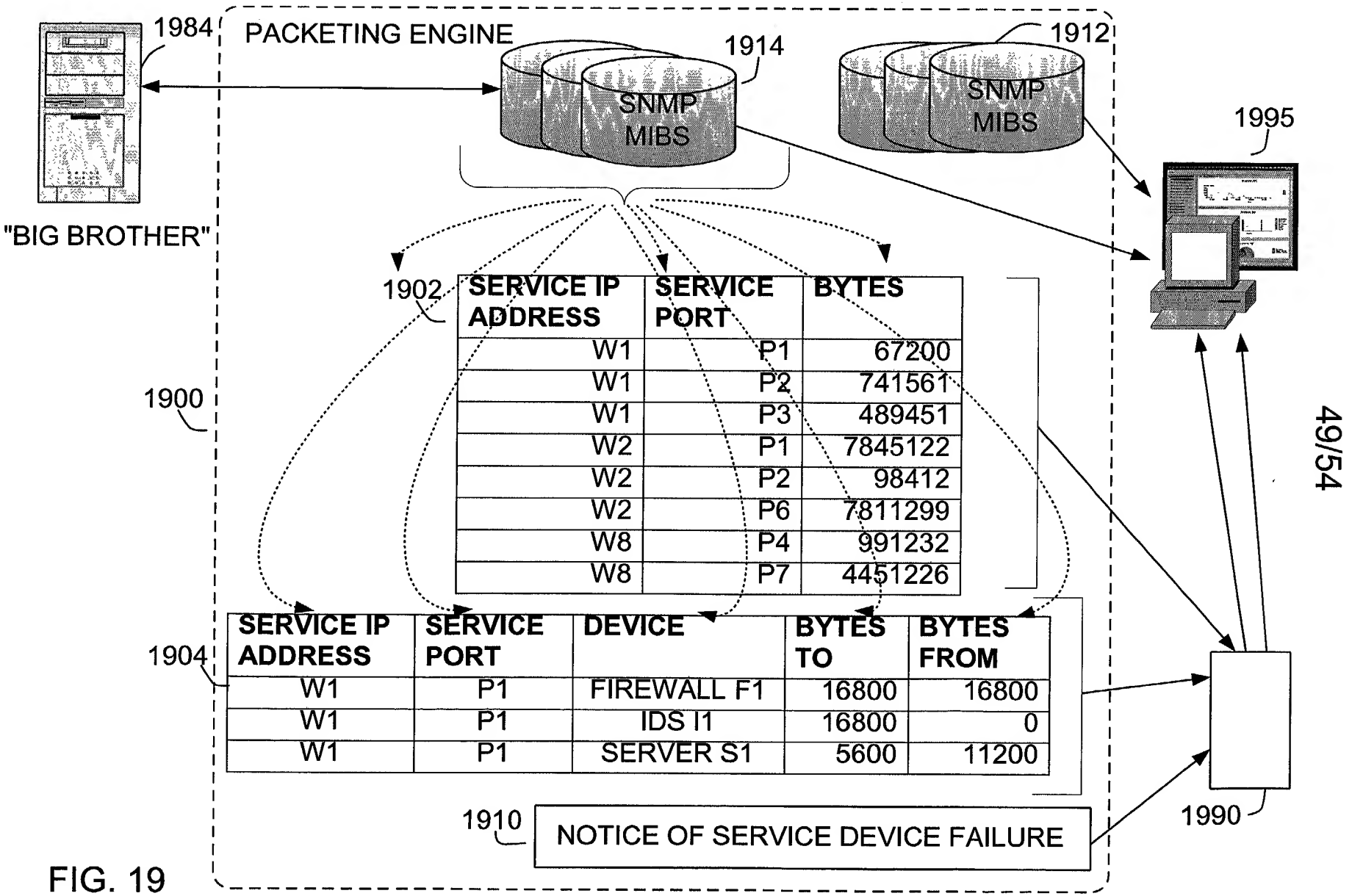

1890
1802
PROVISIONING ENGINE
BANDWIDTH RESTRICTION
1820
MEGABIT
I_0
I_1
PACKETING ENGINE
LOAD BALANCING ACROSS LIKE DEVICES
1804
1822
OPERATING SYSTEM
REAL-TIME PERFORMANCE TRACKING
GIGABIT
TERABIT
I_n
TCP AND IP STATELESS
1806
1810
1808
INTERNAL SEARCH HASH TABLE
1800
KEY
1812
1824
1814
VARYING QOS HONORED
MASTER RULES
I/F RULES

FIG. 18



SERVICE IP ADDRESS	SERVICE PORT	BYTES
W1	P1	67200
W1	P2	741561
W1	P3	489451
W2	P1	7845122
W2	P2	98412
W2	P6	7811299
W8	P4	991232
W8	P7	4451226

SERVICE IP ADDRESS	SERVICE PORT	DEVICE	BYTES TO	BYTES FROM
W1	P1	FIREWALL F1	16800	16800
W1	P1	IDS I1	16800	0
W1	P1	SERVER S1	5600	11200

FIG. 19

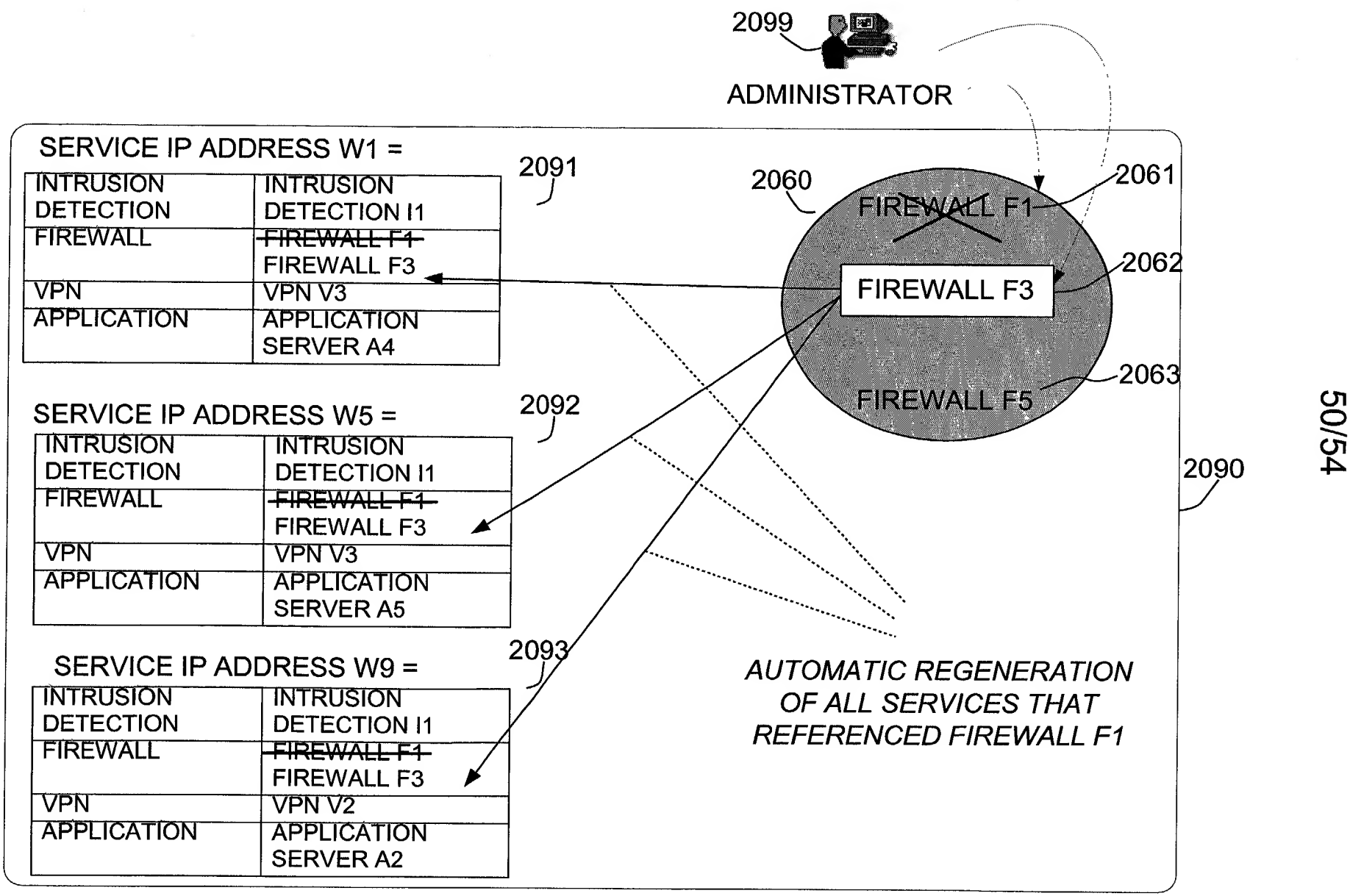

2099
ADMINISTRATOR
SERVICE IP ADDRESS W1 =
2091
INTRUSION DETECTION
INTRUSION DETECTION I1
FIREWALL
~~FIREWALL F1~~ FIREWALL F3
VPN
VPN V3
APPLICATION
APPLICATION SERVER A4
2060
FIREWALL F1
2061
FIREWALL F3
2062
FIREWALL F5
2063
2090
SERVICE IP ADDRESS W5 =
2092
INTRUSION DETECTION
INTRUSION DETECTION I1
FIREWALL
~~FIREWALL F1~~ FIREWALL F3
VPN
VPN V3
APPLICATION
APPLICATION SERVER A5
SERVICE IP ADDRESS W9 =
2093
INTRUSION DETECTION
INTRUSION DETECTION I1
FIREWALL
~~FIREWALL F1~~ FIREWALL F3
VPN
VPN V2
APPLICATION
APPLICATION SERVER A2
AUTOMATIC REGENERATION OF ALL SERVICES THAT REFERENCED FIREWALL F1

FIG. 20

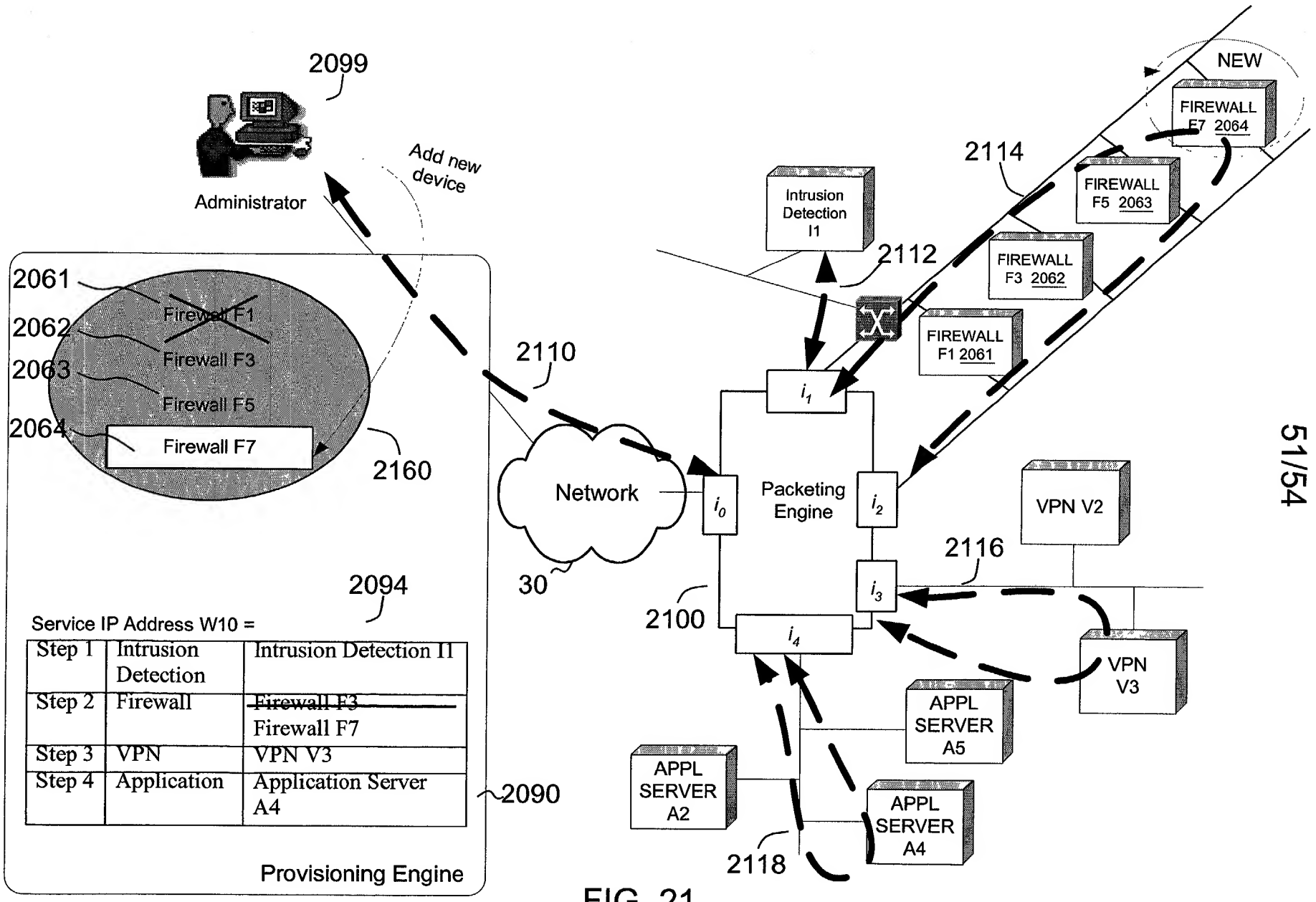

2099
Administrator
Add new device
2061
Firewall F1
2062
Firewall F3
2063
Firewall F5
2064
Firewall F7
2160
2110
Network
30
2094
Service IP Address W10 =
Step 1 | Intrusion Detection | Intrusion Detection I1
Step 2 | Firewall | ~~Firewall F3~~ Firewall F7
Step 3 | VPN | VPN V3
Step 4 | Application | Application Server A4
2090
Provisioning Engine
Intrusion Detection I1
2112
2114
NEW
FIREWALL F7 2064
FIREWALL F5 2063
FIREWALL F3 2062
FIREWALL F1 2061
i_1
i_0
Packeting Engine
i_2
i_3
i_4
2100
2116
VPN V2
VPN V3
APPL SERVER A5
APPL SERVER A2
APPL SERVER A4
2118

FIG. 21

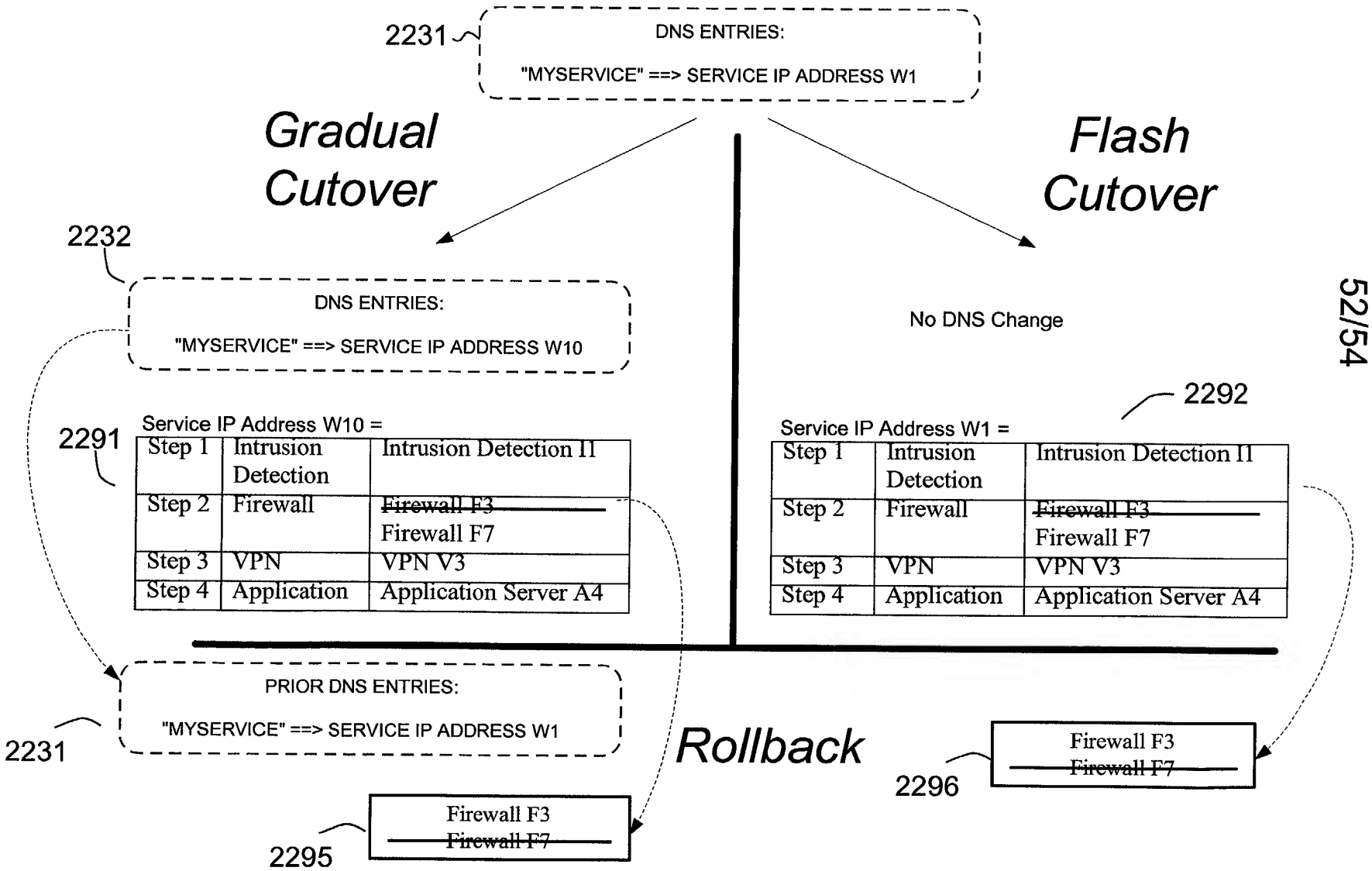

2231
DNS ENTRIES:
"MYSERVICE" ==> SERVICE IP ADDRESS W1
Gradual Cutover
Flash Cutover
2232
DNS ENTRIES:
"MYSERVICE" ==> SERVICE IP ADDRESS W10
No DNS Change
2291
Service IP Address W10 =
Step 1 | Intrusion Detection | Intrusion Detection I1
Step 2 | Firewall | ~~Firewall F3~~ Firewall F7
Step 3 | VPN | VPN V3
Step 4 | Application | Application Server A4
2292
Service IP Address W1 =
Step 1 | Intrusion Detection | Intrusion Detection I1
Step 2 | Firewall | ~~Firewall F3~~ Firewall F7
Step 3 | VPN | VPN V3
Step 4 | Application | Application Server A4
PRIOR DNS ENTRIES:
"MYSERVICE" ==> SERVICE IP ADDRESS W1
2231
Rollback
Firewall F3
~~Firewall F7~~
2296
Firewall F3
~~Firewall F7~~
2295

FIG. 22

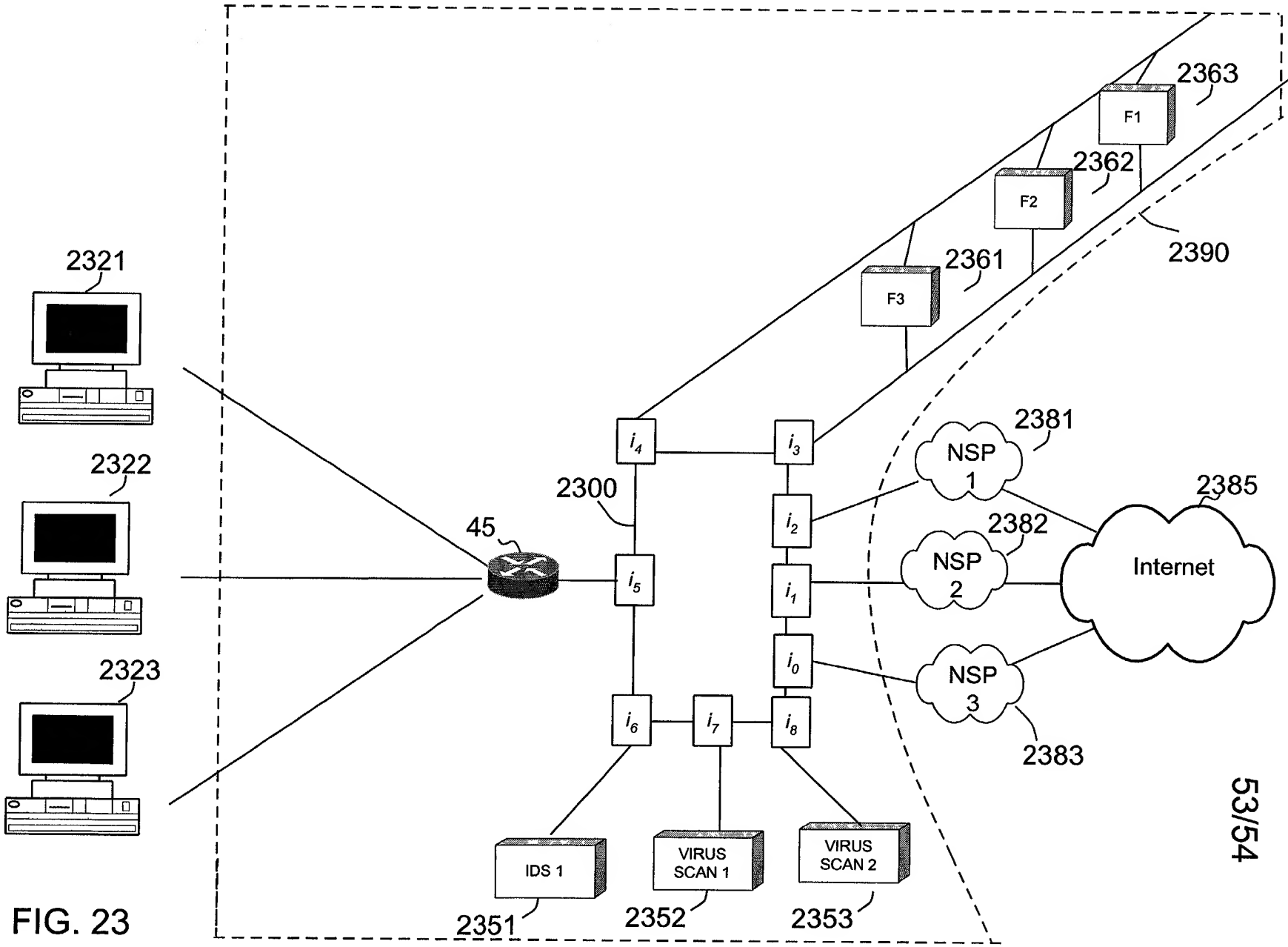


FIG. 23

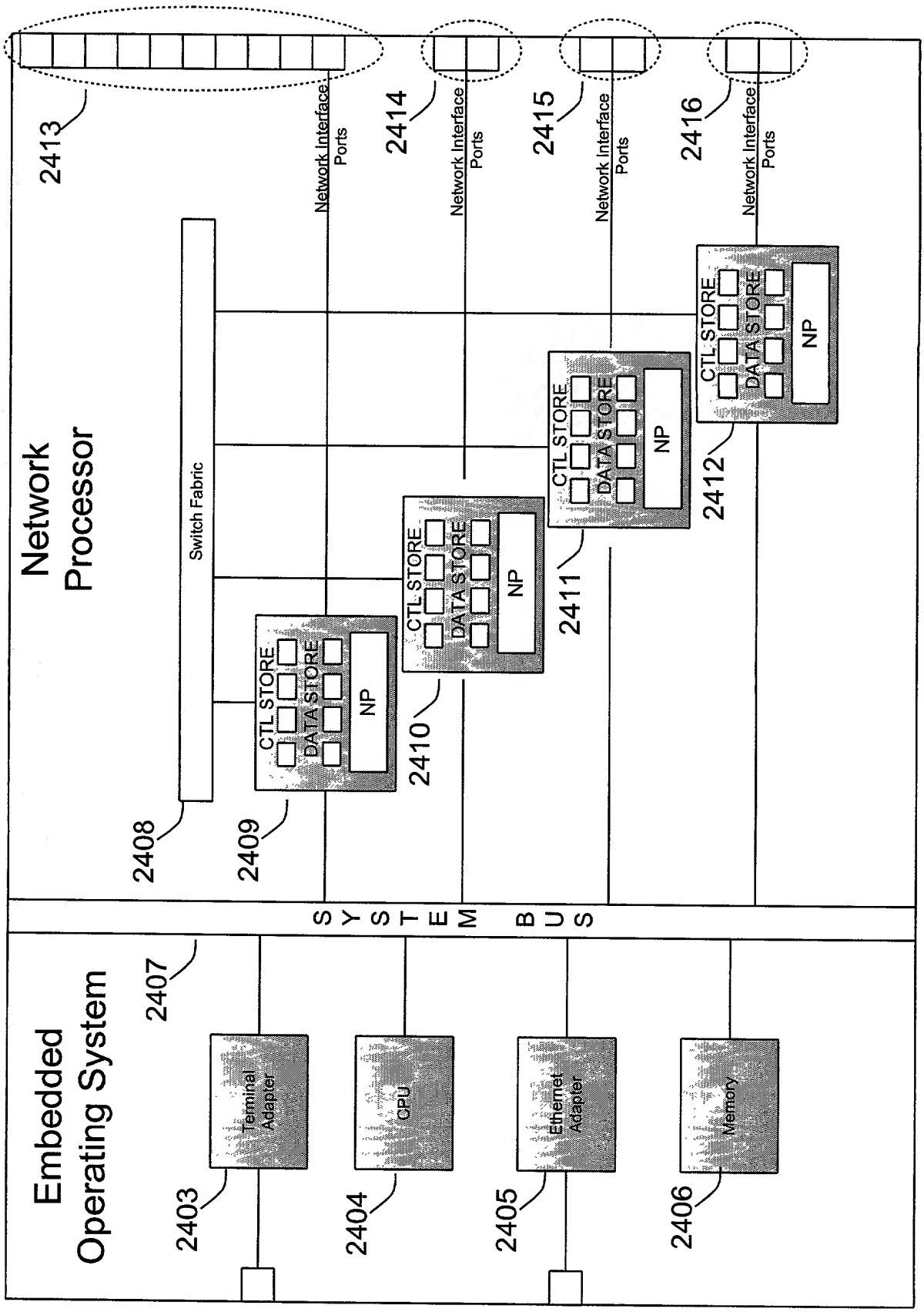

Embedded Operating System
2407
Terminal Adapter
2403
CPU
2404
Ethernet Adapter
2405
Memory
2406
SYSTEM BUS
Network Processor
2413
Network Interface Ports
2414
Network Interface Ports
2415
Network Interface Ports
2416
Network Interface Ports
Switch Fabric
2408
2409
CTL STORE
DATA STORE
NP
2410
2411
2412

FIG. 24